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Health Care and Corporate Finance

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Health Care and Corporate Finance

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Dedicated to my family Steve, Lisa, Shelley, and Randy for their amazing support.

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Health Care and Corporate Finance

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This dissertation examines issues in U.S. healthcare and capital structure. In the first chapter I give a brief summary of the institutional details of the U.S. healthcare sector with a special emphasis on healthcare finance. In addition to its large size, U.S. healthcare has four unique features that can be used to help answer corporate finance questions: segmented markets, variation in corporate type, extensive data requirements and recent consolidation. I explain how changes over the last 100 years have led to each of these features. Next, I delve deeper into bargaining between insurance companies and hospitals, Medicare pricing, and hospital capital structure decisions during my sample period, 2008-2012. Finally, I conclude with a brief discussion on how the Affordable Care Act has contributed to these factors.

In the second chapter I use the health care industry as a novel laboratory in which to study a firm's strategic use of debt to enhance their bargaining power during negotiations with non-financial stakeholders. I show that

reimbursement rates negotiated between a hospital and insurers for a specific procedure are higher when the hospital has more debt. I also show that this effect is stronger when hospitals have less bargaining power relative to insurers ex ante, and that hospitals take on more debt when they have less bargaining power using six proxies including differences in state Medicare laws to further strengthen identification. This is the first paper to provide direct evidence that debt improves a firm's bargaining outcomes.

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Chapter 1

Introduction and Institutional Details

1.1 Introduction

The U.S. healthcare sector is large and growing with spending of $3.1 trillion in 2014 (17.1% of GDP) and estimates of over $5 trillion by 2022.[1]. This makes the U.S. healthcare sector the fifth-largest economy in the world in 2014 at $3.1 trillion, lagging only behind the U.S., China, Japan and Germany.[2] This is partly due to the size of the U.S. economy, but the size of the healthcare sector relative to GDP is also by far the largest of any OECD country. Figure 1.1 shows that U.S. spending as a percentage of GDP has been increasing relative to other countries since 1980 and today it is almost double the average of the other OECD countries.

A lot of this spending comes from the high price of insurance, which in many cases is passed through employer-based insurance, to workers reducing total consumer surplus. In addition, this industry is worth studying because of its direct implications on well-being and length and quality of life. For

[1]Centers for Medicare and Medicaid research on national health expenditures http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/downloads/proj2012.pdf

[2]World GDP figures taken from http://knoema.com/nwnfkne/world-gdp-ranking-2015-data-and-charts.

these reasons and many more, this industry has been a source of focus for policymakers, academics, and the general public alike. Furthermore, I argue healthcare provides an opportunity to provide insight on corporate finance questions because of four unique institutional features.

First, healthcare provision is segmented geographically for a number of reasons, including bilateral negotiations between local hospitals and insurance companies, patient travel costs and the referral system by which general physicians will recommend local specialists. This is beneficial for an econometrician because there is substantial cross-sectional variation due to local market forces and government regulation over time. There are 388 metropolitan statistical areas (MSAs) and 541 micropolitan statistical areas, which enables the researcher to find similar areas with one-off differences to help isolate a causal relationship of interest.[3]

Second, there are nonprofit, for-profit and government hospitals in almost every area of the country. This is useful in studying the differences between each corporate classification with an appropriate counter factual in the same area. In particular, nonprofits are a huge part of the U.S. economy that are understudied by academics because of the lack of data availability and comparison firms. Nonprofit firms have no equity holders and do not pay taxes, which has important implications on how they raise capital and their capital structure. These features can also be used to help disentangle

[3]There is no consensus in terms of the proper level of segmentation. Researchers at the Dartmouth atlas have classified 306 hospital referral regions (HRRs) as an alternative.

alternative theories.

Third, government regulation and subsidies have forced extensive data requirements for hospitals that recently have gotten even more stringent as part of the Affordable Care Act. This data includes balance sheet information, quality measures, prices and utilization figures. The availability of such detailed panel data for thousands of hospitals can help answer corporate finance questions.

Finally, there has been substantial consolidation among hospitals and insurance companies since 1980. With minimal intervention from the Federal Trade Commission (FTC), both groups have continued to merge for efficiency reasons and to consolidate their bargaining power. This creates substantial time-series and cross-sectional variation in market competition measures that can be used for identification. Figure 1.2 shows that the average hospital Herfindahl-Hirschman Index (HHI) has increased from 1,500 in 1990 to 2,800 in 2012, as well as the number of mergers each year.

In section 1.2, I describe the basic U.S. healthcare framework and how it has evolved over time. In section 1.3, I delve deeper into the institutional details for my sample period, 2008-2012. Section 1.4 concludes with a brief discussion on the Affordable Care Act.

1.2 History

In this section, I first describe the major agents involved in healthcare and then the evolution of U.S. hospitals and health insurance programs, including Medicare. The majority of the historical section relies on research from "In Sickness and In Wealth: Hospitals in the 20th Century", written by Rosemary Stevens.

1.2.1 Major Players in U.S. Hospitals

Approximately 100 years ago, healthcare was a fairly standard market in which consumers (patients) paid providers directly for their services. One major caveat was that prices were not posted, so patients did not know the cost in advance. Starting in the 1930s with Blue Cross, local insurance programs began to help assure that the poor and middle class had access to care by spreading the risk over the entire population.[4] At this point, healthcare could have been classified as a market with limited regulation and relatively straightforward bargaining between providers and insurance companies. Over time, the U.S. government has become more involved in regulating and funding healthcare so that broadly speaking, the same four groups, patients, care providers, insurers, and regulators dominate the market today. More precisely, each of these groups contains multiple different players, and the additional interactions add complexity to the healthcare system.

[4]Blue Cross, at the time a tax-exempt program, was the solution as it targeted large local employers, framing itself as a community scheme as opposed to a welfare scheme, excluding unemployed, elderly and part-time workers.

Over time, patients have consistently increased demand for healthcare, while often being shielded from the rising costs. In addition, access to care has been historically uneven, with limited access for the poor and indigent. Attempting to resolve these two issues has resulted in more governmental intervention over time. Healthcare providers range from doctors and therapists to laboratories and hospitals. I focus on hospitals in this paper because of data availability and their large influence on healthcare finance.

Generally, there are three different corporate types of hospitals in the U.S.: nonprofit, government and for-profit hospitals. The majority of hospitals are nonprofits (approximately 65%), which are historically community-based. Providing some subsidized care for the poor, they do not pay state or federal taxes, and rely on endowments and debt to raise capital because they have no equity holders. Government hospitals receive the majority of their funding from state, local and federal governments, and provide a disproportionately high amount of uncompensated care. For-profit hospitals are investor-owned hospitals that pay taxes and often provide relatively little uncompensated care. Regardless of organization type, many hospitals are now jointly-owned, operated or managed in what is known as a hospital system. Belonging to a hospital system generates a number of benefits for a hospital, including lower fixed costs and consolidated bargaining power. I further discuss these differences and their implications in the subsequent sections.

The health insurance industry also contains a variety of organizational forms, including private, employer and government-sponsored, with some in-

dividuals covered by multiple programs. Historically, care was reimbursed as either a percentage of costs or as a fee for service. Fee-for-service programs give patients more flexibility in the care they receive with greater cost sharing, and hospitals are reimbursed for each procedure performed. Over the last 30 years, there have been multiple attempts to control costs and quality of care through managed care organizations (MCOs), such as preferred provider organizations (PPOs), or health-maintenance organizations (HMOs). Managed care organizations try to limit unnecessary care and spending with more preventative care and physician incentives to provide less-costly service through a hybrid of fee-for-service, per diem and percent-of-charges contracts. Government-sponsored programs include subsidized insurance for the poor (Medicaid) and programs for the elderly and disabled (Medicare).

The U.S. government's role in healthcare goes beyond government hospitals and government-backed insurance through a number of regulatory channels, including anti-trust regulation and quality assurance. The government has also been instrumental in the expansion of the U.S. healthcare system both on the supply and demand side through a variety of bills and legislation. All the above changes arose due to a lack of care for indigent individuals, rising costs and an effort to improve the quality of care provided. In the next section, I describe how access to care has expanded over time.

1.2.2 Access To Care

Over the last 100 years, healthcare finance has incrementally evolved from a relatively simple system of payment between patient and provider to an incredibly complex system that is difficult for anyone to understand. Prior to 1940, two groups of people had an especially difficult time obtaining healthcare: the poor and those living in rural areas. Charity care was provided by government and some religious-based groups on a limited basis in urban areas. However, more than 50% of U.S. counties had no hospitals, and typically few providers. With smaller populations, it was difficult to fund the buildings and incentivize doctors to live and provide care in these areas.

At the start of World War II, the federal government sponsored expansion of the hospital infrastructure in the name national defense under the Lanham Act. This was the largest government support to date, and helped set the precedent for subsidized expansion in rural areas (Hill-Burton Act) in 1945. The Hill-Burton Act required all states to survey hospital availability and plan expansion on a regional basis providing $1 in federal support for every $2 local groups provided. There was additional support for poor states, ultimately leading to 4,678 projects, mostly in rural areas. This was the first time the U.S. had a nationally defined, regionally organized framework for healthcare. However, issues remained with many Americans lacking insurance and no obvious way to distribute the newest treatments from academic centers to smaller regional hospitals. With the U.S. facing deflation, high unemployment and anti-communism sentiment in 1949, there was no chance for government

health insurance.

The Hill-Burton act helped spur increases in total hospital assets, rising from $2.7 billion to $5.2 billion between 1947 and 1955, and then doubling again by the early 1960s. This was the first large expansion in hospital assets, and was primarily driven by government and nonprofit hospitals. Table 1.1 shows total hospital assets by corporate type from 1947 until 1977. For-profit hospital assets were stagnant around the Hill-Burton Act, and their increase in assets would not begin until after Medicare was passed. Similar conclusions can be drawn by looking at the number of hospitals of each type over time, as seen in Table 1.2. That being said, there was still substantial regional variation, with more for-profit hospitals remaining in the South and West.

The post-World War II era was also the one that saw a huge increase in employer-based health insurance with government subsidies and a favorable tax treatment. Table 1.3 shows that insurance coverage went from 9% in 1940 to 50% in 1950 and then close to 70% by 1960. Furthermore, Table 1.3 shows the expansion of these employer-based health insurance programs, as the market is no longer completely dominated by Blue Cross. Despite the asset expansion, there were still limited hospital resources, and nonprofit hospitals were directing these resources to more expensive procedures and patients, for which they were more likely to receive reimbursements. This tended to be individuals who were covered by third-party payers, because in 1960, hospitals were only getting reimbursed at 57.66% of third-payer rates from the government. The expanding prevalence of third-party insurance also contributed

to hospitals expansion. As they were reimbursed for more procedures, extra charges were passed on to patients via higher insurance premiums, and the feedback loop continued. In addition to expanding the number of individuals, total health insurance benefits skyrocketed from $772 million to $8.7 billion between 1948 and 1964.

Insurance expansion was largely based on employment, so the elderly and poor remained largely uninsured. Medicare was established in 1966 as a government-subsidized insurance for the elderly, and Medicaid was created as a government-backed insurance program for the poor. Medicare payments were paid for by the government and organized by intermediaries as the government tried to stay away from directly influencing providers, with 90 percent of hospitals initially choosing Blue Cross.

Hospitals were reimbursed for reported costs, and the government assumed the hospitals would only increase costs as necessary. Medicare spending was underestimated from Day 1 as there was more utilization than expected, rising inflation, and hospitals were using the government payments to expand their profits. For-profit hospitals were allowed to receive "a reasonable return on equity capital" as part of Medicare reimbursements. Nonprofit hospitals could max their income by including costs of borrowing money, which led them to start to use lots of long-term debt instead of private contributions. Table 1.5 shows the breakdown of funding sources from 1968 until 1981, when the use of debt went from 38% to 69%, while private contributions were cut by more than 80%. The prevailing wisdom in the 1970s was that proprietary competition

led to more efficient markets. Nonprofit hospitals were now praised for making money, as this was a sign they were operating efficiently even renaming their status as nonprofit as opposed to not for profit.

After 1970, the vast majority of Americans had some sort of insurance and there were incentives for hospitals to increase volume as patients were paying little out of pocket at the time of care. These incentives existed for both nonprofit and for-profit hospitals, with the only real difference being their tax status, which opened the nonprofit hospitals up for more scrutiny as the costs and spending increased substantially.

Congress was concerned that hospitals and Blue Cross were gaining as much from the government subsidies as the beneficiaries. In 1970, Nixon suggested a health maintenance strategy as a way to restructure, decentralize, privatize and make healthcare provision more competitive. This was the same time that hospitals began to consolidate with nonprofit systems and church systems and that for-profit chains were growing. For example, in 1975 Hospital Corporations of America (HCA) was receiving 30 percent of its revenue from Medicare.

Consolidation continued as a means for hospitals to pay down debt on buildings and as a way to increase bargaining power. By 1982, one-third of all hospitals and 36 percent of beds belonged to a hospital system. This consolidation would accelerate in the 1990s and 2000s, as can be seen in Figure 1.2 and Table 1.4. In 2014, 57% of all U.S. acute-care hospitals were part of a hospital system, defined as two or more hospitals that are either jointly-owned,

sponsored, or managed by a central organization.[5] These systems tend to be located within close proximity to one another and provide a number of benefits for the hospitals. These include minimizing fixed costs and increasing their market share, which provides greater market power during negotiations over reimbursement rates.

Hospital costs continued to rise rapidly and in the face of predictions that the Medicare reserve funds would be exhausted, significant reform was executed in 1982. Hospital reimbursements were modified from a cost-based, fee-for-service system to fixed reimbursements for episodes of care called Diagnostic Related Groups (DRGs). Most treatment in a hospital could be grouped into 1 of 467 DRGs. Now hospitals had an incentive to control costs, as they were only paid a base rate regardless of how much it cost the hospital.This was later expanded on January 1, 1992, when Medicare introduced the Medicare Fee For Service (FFS) with reimbursement rates for 7,000 services. There are base prices determined by a group of 29 specialist physicians and then adjusted for cost of living by geographic area.[6] FFS Medicare patients are responsible for co-payments for all services, and therefore are subject to potentially unlimited out-of-pocket risk. Consequently, most individuals will purchase supplemental insurance known as Medigap to cover the majority of co-payments.

[5]http://www.aha.org/research/rc/stat-studies/fast-facts.shtml

[6]There are outlier payments made in addition to hospitals that have patients that are particularly expensive in the care they require.

Medicare parts A and B had its own set of problems with incentives for hospitals to diagnosis patients to maximize reimbursement rates and discharge patients quickly, as any extra resources spent would not be reimbursed. Specifically, the federal government accused many hospitals of shifting the DRGs to yield a higher reimbursement rate from the Medicare system. One example was a case brought by federal investigators against HCA in 1997. Silverman and Skinner (2003) find that both nonprofit and for-profit hospitals were "upcoding" by looking at the frequency in which the most generous DRG for respiratory infections changed from 1989 to 1996. There were also concerns that this lowered the average level of care to these patients.

One solution to these issues was the advent of Medicare part C, which started with the passage of the Balanced Budget Act of 1997. Originally these were called Medicare+Choice, and as of the Medicare modernization act of 1993, they were rebranded Medicare Advantage. Those who are covered do not give up any rights to Medicare, but they must use select providers in surrounding areas. Part C plans are usually HMOs, and patients are required to have a primary care physician. However, they reduce the out-of-pocket expenses for the patient by minimizing co-payments and deductibles. Part C plans have to offer coverage that meets or exceeds standards set by Fee For Service Medicare, but they do not have to cover every benefit the same way. A 2003 law changed the payment formula to overcompensate Part C plans by 12% relative to Fee For Service Medicare to encourage more plans for individuals in rural areas struggling to get the care they need. Traditionally, most Medicare

enrollees choose FFS (75% in 2013), but the number of individuals choosing Medicare Advantage has gone up substantially, from 5.4 million to 15.7 million in the last 10 years.[7]

In addition, the insurer market continued to evolve with even more employer-sponsored plans and the advent of managed-care organizations.[8] These organizations are frequently able to bargain discounts because they limit their patients to certain hospitals providing these hospitals with a steady stream of patients, whereas traditional insurance does not restrict patients, and so they choose doctors and hospitals freely. Put differently, hospitals were forced to become more competitive with their prices to ensure MCO membership, otherwise they would face a large reduction in patient volume. This new system of financing has also led to consolidation in the health insurance market, resulting in 67% of the metropolitan areas and 31 states having an insurer with a market share greater than 50% by November 2012.[9]

1.3 Salient Institutional Details 2008-2012

In this section, I emphasize the relevant institutional details for the sample period of Chapter 2, 2008-2012. In particular, I describe the bargaining

[7] http://kff.org/medicare/issue-brief/medicare-advantage-2014-spotlight-enrollment-market-update

[8] HMO plans rely on more cost sharing with patients through co-payments, while PPO plans generally rely on a large deductible and co-insurance. These programs are significantly cheaper because the patient pays for the majority of the "first dollars". These features are very similar to the differences between traditional FFS Medicare and Medicare Advantage.

[9] 2012 edition of AMA's Competition in Health Insurance: A Comprehensive Study of U.S. Markets

process between hospitals and insurance companies, Medicare pricing and the differences by corporate type, including the factors that determine a hospital's capital structure.

1.3.1 Bargaining Between Insurance Companies and Hospitals

The negotiation process between hospitals and insurance companies is extremely complicated, both initially and upon renegotiation.[10] Negotiation between hospitals and insurance companies is typically done within the local geographic hospital system level, though the reimbursement rates may vary hospital by hospital within a system. For example, HCA has regional offices that will negotiate with local insurers over the reimbursement rates for all hospitals in the area, but would not bargain for the entire country. There are exceptions, though, as some mergers have overcome antitrust concerns by agreeing to bargain separately from the rest of the hospital system.[11]

The primary determinant of bargaining outcomes is the relative size of the hospital and insurer. Consistent with standard bargaining theory, hospitals and insurers with greater market shares are able to demand higher and lower reimbursement rates, respectively.[12] Although size is a major determinant, there are a number of other factors, including negotiation skill, quality of care, case mix, solvency, hospital capacity, frequency in which claims are denied and

[10] In addition to the papers cited below, this section benefited from multiple conversations with executives at Intermountain Health Care and Hospital Corporations of America.

[11] Balan and Brand (2014)

[12] Studies in healthcare that draw these conclusions include Melnick et al. (1992), Brooks et al. (1997), and Halberasma et al. (2011), among others.

organizational status. Lewis and Pflum (2014) argue that requisite negotiation skill is one of the leading reasons for the substantial variation in reimbursement rates across hospitals. Pauly (1998) and Sorensen (2003) find that even small MCOs are frequently able to negotiate substantial discounts from hospitals because of their ability to channel patients to specific hospitals.

The final contracts are typically hundreds of pages with specific reimbursement agreements for thousands of procedures. These agreements may come in the form of fee-for-service, per diem, percentages of costs or some combination of these. Gaynor, Ho and Town (2015) note that the bargaining power of the hospital is an important factor in the contract form, with hospitals preferring lower-powered incentives and insurers preferring higher-powered incentives. Negotiation usually occurs annually unless there is a significant change in the hospital's organization such as a merger or a change in system affiliation.

1.3.2 Medicare Pricing

Medicare enrollees can choose either traditional Fee For Service (FFS) Medicare or Medicare Advantage.[13] FFS permits beneficiaries more flexibility in care, with greater cost sharing through higher deductibles and co-payments. Most FFS members mitigate the potential unlimited out-of-pocket expense by purchasing supplemental insurance known as Medigap policies. FFS Medicare

[13]Approximately 75% of enrollees choose traditional FFS Medicare and 25% enroll in Medicare Advantage

has a provider fee schedule for more than 7,000 services with reimbursement rates adjusted for geographic differences in cost of living.[14] [15]

Medicare benefits are typically less generous than the typical large employer. Most part B people pay an insurance premium of $100/month. Since 2007, they have added an income-based premium for wealthy individuals. Forty percent receive supplemental insurance from a former employer, 30% get plan C, and most of the rest get private supplemental Medigap insurance. Policy forbids people from having both Medigap and Part C coverage.

Hospitals have the option to decline FFS Medicare, accept the fee schedule after geographic adjustment, or request additional reimbursements.[16] In the last case, the supplemental reimbursement amounts are bargained over by Medigap insurers as part of their entire negotiation process. Bargaining variation for FFS patients is limited to the supplemental payments because the base rate is set and paid for by the U.S. government. Medicare Advantage patients are enrolled in MCOs, and the MCOs bargain with hospitals over the entire reimbursement amount independent of the FFS price. With a larger scope for negotiation, these prices tend to have greater variation across hospitals.

[14] The fee schedule is priced on a Resource Based Relative Value Scale (RBRVS) or more simply the resources required for the procedure. RBRVS is based on three Relative Value Units: physician work (52%), practice expense (44%) and malpractice expense (4%).

[15] Hospitals can also receive supplemental payments for extreme costs known as outlier payments.

[16] Virtually all general acute care hospitals accept Medicare, so it is unlikely this would bias my sample in any way.

1.3.3 Nonprofit verus for profit

Hospital balance sheet data is complicated by variation in corporate type and the existence of hospital systems. There is quite a bit of research that focuses on the differences between nonprofit and for-profit hospitals. Nonprofits have no equity holders, and so receive financing from revenue, debt, philanthropy, government subsidies and internal funds. Meanwhile, for-profit hospitals can issue both debt and equity. In addition, nonprofit hospitals do not pay state or federal taxes, so they do not receive a traditional debt-tax shield. This is offset by the fact that nonprofits can borrow more cheaply because any debt they issue provides abatement at the personal level.

Nonprofit hospitals' reliance on philanthropy was significantly reduced after Medicare was passed because hospitals could issue debt and pass on the costs to the government. By 1983, only 0.4% and 1% of funding came from philanthropy for nonprofit and government hospitals, respectively.[17] In addition, Sloan et al (1990) find that the increased third party insurance coverage crowded out donations. Typically, nonprofits are subject to a "project financing rule," which requires these hospitals to issue debt only when they have the capital earmarked for a specific investment. That being said, there are nonprofit hospitals that manipulate their balance sheet to try and take advantage of their tax exempt status. For example, the University of Pittsburgh Medical Center was famous for a tax arbitrage scheme in which it was borrowing short-

[17]Institute of Medicare For Profit Enterprise in Health Care (1986) published by the National Academy Press)

term and investing long-term in order to capture the interest-rate spread. This eventually backfired during the financial crisis as short-term borrowing costs shot up.

There is extensive literature that suggests that nonprofit hospitals act similarly to for-profit hospitals along a number of dimensions. After controlling for size and patient type, Wedig (1988) finds no difference in capital structure by corporate type. Bowman (2002) finds nonprofit hospitals borrow more when they receive endowments, consistent with optimizing leverage as if they follow the trade-off theory of capital structure. Similarly, Wedig et al (1996) model and find evidence that nonprofit hospitals issue debt until the point that benefits are offset by agency and bankruptcy risk. Lastly, Duggan (2002) uses responses to changes in regulation and finds nonprofit hospitals respond similarly to for-profit hospitals. It is also worth noting that nonprofits are legally required to provide free care to some patients, and thus are forced to bargain aggressively with insured patients to ensure they make up for lost resources and remain a going concern.[18]

Another complicating factor, especially with respect to balance sheet data, is that each hospital has to report its financials to the Centers for Medicare, but many hospitals are jointly-owned. This means that some systems will issue debt at the parent level and then transfer assets or liabilities between subsidiaries. That being said, hospital systems tend to leave autonomy at the

[18]This argument was made during an interview I had with an executive for a nonprofit hospital.

subsidiary level, and a researcher can always value weight or equal weight and combine measures to the system level.

Summary stats for my sample in 2012 by corporate type can be found in 1.6. There are a total of 2,197 hospitals, of which 20% are for-profit, 65% are nonprofit, and 15% are government hospitals. Missing observations for HHI_Insurer are because the hospital is located outside of an MSA. Government hospitals have the greatest proportion of these missing, and have both the highest HHI_Insurer and HHI_Hospital among the corporate types confirming they are more likely to be found in rural areas or areas that have insufficient facilities. They are also significantly less likely to be part of a system, and are less profitable.

For-profit hospitals are the smallest, have less-volatile earnings, are more likely to be a part of the system, and use little long-term debt. In addition to being greatest in frequency, nonprofits on average are the largest, and have the highest leverage. Table 1.7 shows similar summary statistics split on whether or not a hospital is part of a system. In 2012, 68% of hospitals were part of a system. Stand-alone hospitals were smaller, had higher leverage, and were less likely to be part of a teaching hospital.

1.4 Conclusion

The U.S. healthcare system is a massive economy that has undergone a series of changes for the last 100 years, eventually leading to the complex industry it is today. The size of the economy alone warrants academic study,

but unique institutional features also provide an opportunity to provide insight into corporate finance questions. First, healthcare provision is segmented geographically, creating cross-sectional variation by metropolitan area. Second, there are nonprofit, for-profit and government hospitals in most markets, enabling comparisons by corporate type. Third, government influence and intervention has led to substantial data requirements for hospitals. Finally, the entire industry has undergone consolidation for the last 30 years, creating time-series variation in market competition measures.

There are broadly four main groups involved in U.S. healthcare: patients, care providers, insurers and regulators. The role of insurers and regulators in the economy has gradually increased over time to help ensure everyone had access to care, with a special focus on individuals who are poor or live in rural areas. The government's role has also changed with concerns over the rising costs over time.

Medicare reimbursements have evolved in line with other insurers. At times, reimbursements have been a percentage of costs or a fixed amount per procedure, and have evolved to what is now a more complex contract that uses a combination of per diem, fee-for-service and a percentage of costs to align the incentives of cheaper costs and quality care. These contracts have also altered the financing in hospitals, in particular in nonprofit hospitals that now rely less on donations and more on debt.

On March 23, 2010, President Barack Obama signed the Affordable Care Act (ACA) into law. The goal of the policy was to increase the number

of individuals that were uninsured by mandating that all individuals purchase health insurance, eliminating the adverse selection that arises in insurance markets. The effect would be that younger, healthy individuals can then help subsidize individuals with pre-existing conditions. It is also hoped that this will reduce the total cost of the U.S. healthcare sector, because previously uncovered individuals who relied on more-expensive emergency care will now use more preventative care with regular physician visits.

The law was supposed to allow individuals to purchase cheaper policies on state-run exchanges in 2014, but many states refused to operate these exchanges for political reasons. The Obama administration, coupled with the states that created exchanges, have now set up a national exchange, which ensures individuals can purchase insurance and also limits how much insurers can raise their rates. Since the passing of the ACA, the number of big U.S. health insurers, covering approximately one-third of the market, has decreased from five to three (Anthem/Cigna, Aetna/Humana and United). This consolidation is believed to be a response to smaller profit margins and higher compliance costs. Similar consolidation is in process by hospital systems in an effort to increase their bargaining power. It will be interesting to see how far this consolidation goes and how it affects the pricing of services.

Chapter 2

Leverage and Bargaining Benefits: Evidence from U.S. Hospitals

2.1 Introduction

Capital structure research traditionally focuses on the consequences of debt for a firm's financial stakeholders (i.e., shareholders and creditors). However, a firm's financial structure can also impact other agents with which it transacts, including employees, customers, and suppliers (e.g., Titman (1984)). One strand of the literature has argued that debt may strengthen a firm's bargaining position vis-á-vis these "non-financial stakeholders," allowing it to extract more surplus at these stakeholders' expense (e.g., Bronars and Deere (1991)). Existing evidence suggests that firms take on more debt when facing strong non-financial stakeholders such as unions (Matsa (2010) and Agrawal and Matsa (2013), among others), consistent with firms levering up when the benefits of augmenting their bargaining power are high. However, except in cases of severe financial distress (Benmelech, Bergman and Enriques (2012)), there is no evidence that debt actually impacts bargaining outcomes. That is, the most direct implication of the argument that leverage enhances bargaining

power remains untested.[1]

The primary challenge in investigating the effect of debt on bargaining is that econometricians rarely observe measurable bargaining outcomes. Moreover, even if outcomes are observed, heterogeneity in the services or goods being bargained over in most settings would make assessing such an effect difficult. This paper uses the health care industry as a novel laboratory to overcome this challenge. Two features in particular make this setting appealing. First, the availability of data on prices negotiated between hospitals and insurers for specific medical procedures, at least some of which are almost perfectly homogeneous, makes it possible to surmount the data limitation. Second, cross-sectional variation in market structure and state laws makes it possible to test whether the sensitivity of bargaining outcomes to a hospital's debt varies with the ex ante bargaining power of hospitals along multiple dimensions.

Debt can strengthen a firm's bargaining position with non-financial stakeholders for at least two reasons. First, debt commits a firm to pay part of the surplus created by successful negotiation to creditors in the form of interest payments. This limits the amount of remaining surplus over which non-financial stakeholders can bargain.[2] Second, most firms repeatedly trans-

[1]Benmelech, Bergman, and Enriques (2012) present evidence that financially distressed airlines are able to extract pension concessions from employee labor unions. However, this is an extreme case. Most firms that take on debt never become financially distressed.

[2]This is the argument made in Myers (1977) and Hennessy and Livdan (2009), among others.

act with the same non-financial stakeholders and face spillover distress costs if these stakeholders are under financial distress. A firm's stakeholders therefore have incentives to leave the firm with sufficient surplus in order to avoid financial distress and possibly dissolution (e.g., Perotti and Spier (1993) and Rajan and Petersen (1995)). I construct a simple model using this intuition to develop my hypotheses further in Section 2.2.

To test whether debt affects bargaining outcomes, I use annual hospital balance sheet data and data on reimbursement rates (i.e., prices) negotiated by hospitals for a specific medical procedure, colonoscopy without biopsy.[3] I focus on this procedure because, unlike most procedures hospitals perform, it is almost perfectly homogeneous across hospitals. The lack of variation in the nature of the procedure ensures that differences in prices are due to variation in bargaining as opposed to differences in quality or quantity of care.[4] For other types of procedures, differences in the care provided across hospitals could be systematically correlated with both reimbursement rates for the procedure and other hospital characteristics including capital structure, muddying inference.[5]

Controlling for hospital and metropolitan statistical area (MSA) characteristics as well as hospital fixed effects to account for other factors that might affect bargaining outcomes, hospitals with more leverage receive higher

[3]These prices are for Medicare patients and include all payments received by the hospital.

[4]Additional care or complications during a colonoscopy lead to alternative classifications and therefore will not be included in my sample.

[5]In addition to these endogeneity concerns, pricing data is expensive and I was given a discount for only purchasing one procedure.

reimbursement rates. The economic magnitude of the relation is significant: A one standard deviation increase in a hospital's book leverage is associated with an approximately 5% increase in the average margin it receives per colonoscopy. These results are robust to controlling for a number of variables including: hospital type, spending, costs, and market competition measures.

While focusing on the price of a homogeneous procedure helps to eliminate one potential source of endogeneity, there remain a number of alternative explanations for the relation between leverage and reimbursement rates. For example, manager skill may be an omitted variable in that more skilled hospital managers might be able to both negotiate higher prices and might also choose to operate with higher leverage for a variety of reasons, including tax motives. Another concern is that causality could run in the opposite direction because, holding costs and volume fixed, higher prices imply higher income, increasing the benefits of debt tax shields. The robustness of the results to controlling for hospital fixed effects helps to address these concerns by ensuring that any omitted factor must be time-varying within hospitals to explain them. However, this does not rule out the possibility that such time-varying factors contaminate causal inference. It is also possible that debt affects reimbursement rates for reasons unrelated to bargaining power. For example, a hospital may finance upgrades to its facilities - which could enable them to charge higher reimbursement rates - by issuing debt. Alternatively, hospital managers may be motivated to bargain hard with insurers for higher reimbursement rates when the hospital is highly-leveraged, consistent with

Jensen's (1986) argument that the threat of bankruptcy created by debt disciplines managers.

To further test whether the estimated price-leverage relation is driven by the bargaining benefits of debt, I examine how the relationship varies with a hospital's ex ante bargaining power. A hospital with relatively high ex ante bargaining power already extracts most of the surplus from its relationships with non-financial stakeholders, even without the pre-commitment effects of debt.[6] If the relation is driven by leverage allowing a hospital to extract concessions from insurers, then it should be stronger when the hospital's ex ante bargaining power is weaker. I use the fact that healthcare provision is segmented geographically to test this prediction by employing six proxies: partnership status with other hospitals, market share, whether the hospital is located in a metropolitan area, number of hospitals in the local market, concentration in the local insurance market and whether the state has requirements on supplemental Medigap premiums.[7] I find reimbursement rates are more sensitive to hospital leverage when a hospital is not part of a hospital system, is smaller, is located in a metropolitan statistical area, competes against more hospitals, bargains with concentrated insurers and if it is located in states with Medigap premium laws. These results further support the argument that the relation between reimbursement rates and hospital leverage is driven by the bargain-

[6] At the extreme, if the firm has 100% of the bargaining power, debt will not change the amount the firm receives.

[7] I use six measures because each measure brings separate endogeneity concerns that do not hold for other measures. I discuss each of these proxies in more detail when I explain the data.

ing benefits of debt. It is unclear why alternative explanations would predict that the effect of leverage would be greater for hospitals with lower bargaining power.

It could be argued that hospitals issue debt to invest in nicer facilities and this enables them to charge higher reimbursement rates because partnership status with other hospitals and capital expenditures are substitutes. In order to alleviate this concern, I control for a hospital's capital expenditures in all regression analyses. In addition, I test the sensitivity of bargaining outcomes to leverage conditioning on whether assets or liabilities have increased since the previous year. I find that the relation between leverage and bargaining outcomes only exists after an increase in liabilities and the coefficient is actually larger if there is no corresponding increase in assets. This result is more consistent with the bargaining benefits from debt, as opposed to an investment story.

Tax-based alternative explanations are especially a concern because tax minimization motives play a major role in capital structure theory. I bolster the evidence against alternative tax based explanations by exploiting a unique feature of the health care industry. Some hospitals are for-profit entities, while others are nonprofit organizations. As nonprofit hospitals do not pay taxes, any relation between leverage and negotiated prices driven by tax incentives should hold only among for-profit hospitals. Contrary to this argument, I find that the relation is stronger in nonprofit hospitals. Overall, the evidence supports the argument that debt enhances a firm's negotiation outcomes with

its non-financial stakeholders.

To date the literature on the bargaining benefits of debt has focused on the capital structure decisions of firms because negotiation outcomes are difficult to observe, especially for a broad cross section of firms.[8] Consistent with the prior literature, I find that a hospital's leverage is negatively related to its ex ante bargaining power using the same measures of bargaining power as before. Specifically, I find that hospital leverage is negatively related to hospital market share, lower when the hospital is a member of a system, and higher if it operates in a state with Medigap pooling laws. In addition to confirming findings from the labor literature, these results further validate my use of these measures of bargaining power as a source of predicted cross-sectional variation in the sensitivity of reimbursement rates to leverage.

My paper relates to the literature on the strategic use of leverage during bargaining with a firm's stakeholders. The bargaining benefits from debt are theorized in several settings including during negotiations with labor (Bronars and Deere (1991); Perotti and Spier (1993)); merger negotiations (Israel (1991)); regulated industries bargaining with the government (Dasgupta and Nanda (1993)); and between suppliers and customers (Hennessy and Livdan (2009) and Chu (2012)). The majority of the empirical work has focused on bargaining with labor, in particular the relation between firm leverage and unionization rates. For example, Matsa (2010) uses differences in state laws to

[8]For example, Agrawal and Matsa (2013), Matsa (2010), Klasa, Maxwell, and Ortiz-Medina (2009), and Myers and Saretto (2011).

show that leverage is higher in firms with employee friendly union laws.[9] The only existing paper examining the impact of capital structure on negotiated outcomes is a recent study by Benmelech, Bergman, and Enriques (2012). They use variation in pension funding status' for 12 airlines and find they receive greater pension concessions from labor when they are financially distressed. My paper contributes to the literature on the strategic use of leverage by documenting the bargaining benefit of debt for the entire spectrum of firms from those under distress to solvent firms that face the possibility of future distress costs because of their debt commitments.

My paper also contributes to the health care policy debate. Two major issues of utmost importance are the high cost of care and lack of price transparency that may contribute to these costs. There are a number of papers that examine the impact of market competition on prices in the health care industry.[10] Consistent with Nash bargaining, these papers find reimbursement rates are decreasing in insurance market power and increasing in hospital market power. These results are consistent across a variety of settings including with micro-level data from California (Dor, Grossman and Koroukian (2004)); with appendectomies acting as an alternative homogeneous operation (Brooks, Dor and Wong (1997)); and in the Netherlands (Halberasma, Mikkers, Motchenkova, and Seinen (2011)). My paper contributes to the health care debate by showing that other factors affect pricing beyond market

[9]Other empirical papers include Klasa, Maxwell, and Ortiz-Medina (2009), and Myers and Saretto (2011).

[10]See Gaynor and Voygt (2000) and Dranove and Satterthwait (2000) for surveys.

competition measures.

In Section 2.2 describes the empirical predictions and strategy. I describe the data in Section 2.3. Empirical results are in Section 2.4 and I conclude in Section 2.5.

2.2 Empirical Predictions and Methodology

Firms have relationships with many non-financial stakeholders, including employees, customers, and suppliers. Each relationship a firm has creates surplus, which is divided between the firm and the stakeholder through bargaining over wages, prices, and/or other terms of trade. A firm increases its share of the surplus, and hence its total payoff from a relationship if it can commit itself to a tougher negotiating position prior to bargaining. Debt has been identified as a potentially powerful device for committing a firm to a tough negotiating position for at least two reasons: a credible commitment because the firm has no cash and contagion distress costs.

The first explanation is that debt represents represents a hard commitment to pay out part of the surplus to creditors in the form of interest payments, which limits the surplus available to the stakeholder during negotiations. As a simple example, consider Firms A and B, each of which bargain over the division of $100 of surplus at the end of the period with an outside stakeholder. Before bargaining takes place, firm B borrows $40 to be repaid at the end of the period with a 0% interest rate and pays the proceeds out to shareholders as a dividend. This leaves only $60 of available surplus over

which firm B and its outside stakeholder can bargain. Assuming Nash bargaining with equal bargaining power, firm A's shareholders receive $50, while firm B's shareholders receive $70 ($30 from negotiation and $40 from the dividend).[11]

This intuition is particularly appealing for the labor bargaining literature because the firm is in control of the cash and therefore, can pay a dividend to shareholders. Bargaining from the hospital perspective may be slightly different because a hospital does not control the cash ex ante because it relies on payments from insurance companies. The insurance companies may refuse to pay the hospital, limiting the hospital's ability to credibly commit the surplus. However, because the hospital can commit future payments to its creditors, this intuition should still hold.

The second reason for the bargaining benefits a hospital receives from a commitment to creditors derives from potential contagion distress costs for the stakeholder. A firm's failure to make its contractual interest payments generally results in bankruptcy, which not only imposes significant costs on the firm, but also potentially on the stakeholder. Bankruptcy might result in closure, which will terminate the firm's relationship with the stakeholder, reducing the number of relationships from which the stakeholder receives surplus (e.g., Rajan and Petersen (1995) and Perotti and Spier (1993)). Therefore, the stakeholder may be willing to accept less of the surplus ex ante because that

[11]This intuition is the motivation in Myers (1977), Hennessy and Livdan (2009), Dasgupta and Sengupta (1993), and Dasgupta and Nanda (1993).

will be less costly than the potential contagion distress costs. I formalize this argument in a simple two period model.

A firm and stakeholder bargain over surplus that is normalized to 1 in each of two periods. Without any frictions, the stakeholder will receive α each period and the firm will receive $1-\alpha$. Prior to the beginning of each period, the firm has an option to issue short-term debt which is due at the end of the period with cost c and probability of bankruptcy in the subsequent period of $1-p$. The stakeholder observes the firm's leverage decision and consequently in order to facilitate the firm's solvency, has the option to forego part of the surplus and receive γ ($< \alpha$). I assume that $p\alpha > \gamma$, which means that the stakeholder will never forego surplus in the second period and therefore it is not optimal for the firm to issue debt in the second period. This framework can be solved using backward induction.

In the second period as shown, the firm will not issue debt by construction and thus the payoffs are α and $1-\alpha$ for the stakeholder and firm, respectively. If the firm chooses to issue debt in the first period, the decision to forego will compare the guaranteed payoffs of $\gamma+\alpha$ with the risky payoff from bargaining aggressively $p(\alpha+\alpha)$. This implies that the stakeholder will forego the surplus in period 1 if $p < \frac{\gamma+\alpha}{2\alpha}$. Intuitively, the stakeholder is more likely to forego the surplus if the probability of bankruptcy is higher and/or if the amount it has to forego is smaller. The firm will only issue debt if knows the stakeholder is willing to forego the surplus and that the cost is smaller than the concession it will receive ($c < \alpha - \gamma$).

This framework can be extended to T periods with similar results. In the final period the firm will never issue debt by construction. The decision in period T-1 is identical to the two period model because the stakeholder is considering whether or not to give up part of the surplus for one period to ensure solvency in the final period. If it is willing to forego part of the surplus in T-1, it will also be willing to give up the surplus in all prior periods because the potential lost surplus in bankruptcy is greater with more periods remaining. If the stakeholder is unwilling to forego the surplus in period T-1, ($p > \frac{\gamma+\alpha}{2\alpha}$), it still may be willing to give up the surplus in an earlier period. Following backward induction, it would be willing to forego the surplus in T-2 if $p < \frac{\gamma+2\alpha}{3\alpha}$. Again, once it is willing to forego the surplus in this period it will also be willing to do so in all prior periods. Therefore, the period (T-n) in which the stakeholder is first willing to forego the surplus will have both of the following inequalities hold, $p > \frac{(n-1)\alpha+\gamma}{n\alpha}$ and $p < \frac{\gamma+n\alpha}{(n+1)\alpha}$. This leads to three testable predictions.

Hypothesis 1. Firms with more debt will receive better bargaining outcomes

In the health care sector in particular, there are a number of reasons why insurance companies are concerned with a hospital's leverage. First, insurers want to satisfy their customers, and distress costs may reduce the quality of care provided at a hospital. Second, excess debt may cause a hospital to go bankrupt, which reduces the menu of options available for patients. Third, bankruptcy can be equally problematic for insurers from a pure profit maximizing point of view because the consolidation in the hospital market may

reduce the bargaining power of the insurance company with other hospitals as the hospital concentration increases. These explanations imply that hospitals with more debt should receive higher payments from insurers for performing medical procedures. I test this prediction by estimating the following equation for colonoscopy prices:

$$BargainingOutcome_{i,t} = \alpha + \beta_1 Leverage_{i,t} + \beta_2 X_{i,t} + \gamma_t + \epsilon_{i,t} \qquad (2.1)$$

The variable $BargainingOutcome$ is the average annual reimbursement rate for colonoscopies as described in detail in the data section. *Leverage* is the book leverage of the hospital, $X_{i,t}$ contains a variety of potentially time-varying hospital and MSA controls, and γ_t is a set of year dummy variables. I include hospital fixed effects in some specifications to account for time-invariant unobserved hospital characteristics. A positive and significant β_1 is evidence that firms with higher leverage, ceteris paribus, receive better bargaining outcomes.

The impact of leverage on a firm's bargaining power should vary with the ex ante bargaining power the firm enjoys, i.e., its bargaining power in the absence of leverage. A firm with relatively high ex ante bargaining power in a relationship already obtains most of the surplus, even without the pre-commitment effects of debt. At the extreme, a monopolist firm already receives the entire surplus during negotiations and the use of debt conveys no additional bargaining benefits, whereas a firm with low bargaining power receives a greater increase from the portion of the surplus that is removed. I now show

this more formally using the model. The effect of α on the sensitivity of bargaining outcomes to leverage can be seen by examining the partial derivative with respect to α of the difference of the payoffs for a firm with debt that receives concessions compared to a firm without debt. In the two period setup the second period payoffs are always the same so the difference comes from the payoffs in the first period, $(1-\gamma)-c-(1-\alpha)$.[12] The partial derivative with respect to α is positive, which implies the sensitivity of bargaining outcomes to leverage is increasing in the stakeholder's bargaining power. This leads to the second prediction.

Hypothesis 2. The effect of leverage on bargaining outcomes is stronger for firms with lower ex ante bargaining power

Ideally, I would test this prediction by using a latent measure of ex ante hospital bargaining power. Because, I cannot observe this latent measure I split the sample based on different proxies of ex ante hospital bargaining power, and estimate equation (2.1) separately for each subsample. If debt is a more important factor in negotiations when ex ante hospital bargaining power is low as I predict, then β_1 should be larger for lower than higher ex ante bargaining power subsamples. I implement this test using six measures of ex ante bargaining power: whether or not the hospital is a member of a system (*System*), the hospital's local market share (*MktShare*), whether or not the hospital is located in a MSA (*Urban*), the number of hospitals in

[12] In the T period framework this difference is going to depend on which period the stakeholder is first willing to forego the surplus.

the local market (*NumHosp*), the concentration in the local insurance market (*HHI_Insurer*) and whether or not there are state laws mandating equal premiums on Medigap policies (*Laws*).

Although debt may be useful for committing a firm to a tough bargaining position, the use of debt also exposes a firm to a number of potential direct and indirect financial distress costs. Bargaining models contrast this benefit with a variety of costs including: bankruptcy costs (Dasgupta and Nanda (1993)), moral hazard problems (Dasgupta and Sengupta (1993)), and underinvestment due to debt overhang (Perotti and Spier (1993) and Hennessey and Livdan (2009)). Given these costs, a firm logically only uses debt to gain bargaining power if the benefit is high or these costs are relatively low.

The costs and benefits of debt are captured by the marginal period in which a firm finds it optimal to stop issuing debt. This period, n^*, is determined in the model using the equation from above, $p > \frac{(n-1)\alpha+\gamma}{n\alpha}$. The solution is $n^* = \frac{\alpha-\gamma}{\alpha(1-p)}$. Taking the partial derivative with respect to α leaves $\frac{\gamma}{\alpha^2(1-p)}$, which is strictly positive. This result implies the number of periods in which firms use strategic debt increases in their stakeholder's ex ante bargaining power. Thus, the final prediction that arises from the model suggests a relation between a firm's level of leverage and its ex ante bargaining power. This relation has also been the focus of other similar research in alternative settings.[13]

[13]See for example Matsa (2010) and Klasa, Maxwell, and Ortiz-Medina (2009), among others

Hypothesis 3. Firms use more strategic leverage when they have lower ex ante bargaining power.

I test this prediction by estimating the following equation using the same measures of ex ante bargaining power as regressors on which I split the sample to test the second prediction:

$$Leverage_{i,t} = \alpha + \beta_1 BargainingPower_{i,t} + \beta_2 X_{i,t} + \gamma_t + \epsilon_{i,t} \tag{2.2}$$

2.3 Data

I use three main sources with data over the 2008-2012 sample period to examine whether hospitals use debt to enhance their bargaining power during negotiations with insurance companies.[14] American Hospital Directory (AHD) collects average reimbursement rates along with corporate, geographic and financial data on hospitals that file Medicare claims reports. In addition, AHD obtains proprietary information on the system affiliation of each hospital via a web scraper. The Centers for Medicare and Medicaid (CMS) publish the initial uncleaned claims reports and indices that are used to adjust government payments.[15] Finally, the American Medical Association (AMA) publishes an annual report that includes information on market competition

[14] I use this time frame because the data is expensive, procedure classifications were changed in 2007 and some data is only available a year later.

[15] An example of how AHD cleans these reports is eliminating excess reports when hospitals file multiple times in one year.

between insurance companies within certain MSAs. Figure 2.1 shows a map of the United States, and the dark green sections indicate the MSAs for which there is sufficient data to conduct the majority of the empirical analysis.

I combine different hospital specific data via their unique Medicare identifier and then combine this with metropolitan data via metropolitan codes. There are approximately 6,000 hospitals in each of the five years, creating approximately 30,000 observations for the basic corporate and geographic variables. Of these, approximately one-third of the hospitals are general acute care facilities and have the necessary pricing data.[16] Finally, the insurance competition data is only available for the metropolitan areas, eliminating around 30% or approximately 3,000 of the remaining observations. After requiring that hospitals perform Medicare colonoscopies, report necessary financial data, and are located in an MSA with insurance market competition measures, the sample contains a total of 1,734 general acute care hospitals with 6,685 hospital-year observations.[17]

Table 2.1 provides summary statistics for the variables included in the empirical specifications. *Leverage* is the primary financial variable of interest and is defined as total long-term liabilities scaled by a hospital's total assets.[18]

[16]Other hospitals either refuse Medicare patients or include specialty hospitals such as a cancer or psychiatric hospital.

[17]All continuous variables are winsorized at the 1% level to eliminate potential errors in variables and ensure that regression results are not driven by outlier observations.

[18]I also use an alternative definition *NetLeverage*, which is total long-term liabilities minus cash scaled by total assets. Hospitals on average hold about 5% of their assets in cash as evidenced by the difference between *Leverage* and *NetLeverage*. All tables using *NetLeverage* as the coefficient of interest can be found in the appendix.

The average of 0.303 is very similar to the 0.261 found for the Compustat firms by Matsa (2010) in his study of firm's leverage using variation in right to work laws. The standard deviation of 0.361 is quite a bit larger than the 0.164 in his sample largely because of the inclusion of nonprofit and government hospitals. *NonProfit*, *Profit*, and *Government* are dummy variables based on the hospital's corporate classifications. Over 70% of the hospitals are not-for-profit, and the remainder are split between for-profit (17.5%) and government hospitals (12%). This variation in corporate structure is particularly useful to disentangle the use of leverage for bargaining benefits versus interest tax shields.

Because the profitability of these hospitals can mechanically affect their leverage due to an increase in cash flows, I use net income scaled by total assets, *NetIncomeAssets*. Capital structure theory posits that firms with greater income volatility have incentives to reduce their leverage to minimize distress costs.[19] In order to control for this possibility, I use the net income scaled by volatility, *NetIncomeVol*, defined as the standard deviation of annual net income in millions of dollars across the five-year sample period. An additional concern is that hospital investment can increase a hospital's leverage while at the same time increase their reimbursement rates due to nicer, newer facilities. To help alleviate this concern, I control for *CapEx*, which is defined as the annual difference in hospital assets.

[19]See Titman and Wessels (1988)

Reimbursement rates for the procedure colonoscopy without biopsy (APC code 158) are ideal to employ for this study because the procedure is a straightforward, homogeneous, and frequently-performed operation for Medicare enrollees around the country.[20] The negotiation outcome, *AvPayment*, is the average payment received for this procedure by the hospital for all patients that are enrolled in Medicare including the base payment rate as and adjustment factors, along with extra payments from co-payments, deductibles, and third-party insurers.[21] *AvCost* is the average annual hospital cost of a colonoscopy, which I use as a control in the negotiation outcome regressions and *NumProcedures* is the number of colonoscopies performed at each hospital in a year. *AvPayment* and *AvCost* have similar means of around $500, but the variation in *AvCost* is much higher.[22] The average margin defined as *AvPayment* minus *AvCost* per procedure is $36, which is a benchmark I use to interpret the economic magnitude of the results.

In addition to publishing financial data on Medicare hospitals, CMS publishes a number of other indices. *Teaching* is an indicator variable equal

[20]Complications and additional care are classified by an alternative code ensuring prices are not due to differences in care. The base FFS rate for this procedure in 2008 was $500.02.

[21]FFS base reimbursement rates are determined for each procedure annually by a panel of 29 physicians. These payments are then adjusted for the cost of living in an area and this is the amount the government directly reimburses hospitals. Additional variation in average reimbursement rates are due to bargaining over supplemental payments and Medicare Advantage patients.

[22]I would like to use a Nash bargaining model with negotiation outcomes as a function of the cost and list price, but the high frequency in which costs are actually higher than reimbursement rates precludes this test. One reason costs may frequently be higher than payments is hospitals may differ in how they allocate fixed costs to procedures. Thus, I rely on the average annual payment.

to one if the hospital is associated with a university and I control for it in all empirical tests.[23] *GeoAdjFactor* is an index that is used to adjust base fee schedules for the variation in costs of care arising from cost of living between different metropolitan areas for FFS reimbursement rates.[24] Given that I am focusing on one specific procedure it is possible that differences in prices could be due to differences in demographics. In particular, colonoscopies are recommended for individuals starting at the age of 45 and hospitals in areas with a greater population of older individuals could receive greater payments per colonoscopy because there is greater demand. *PctOver45* is the percent of the population within each MSA that are over 45 as of the 2010 U.S. census.

Since hospitals consolidate via system affiliations in part to enhance their market and bargaining power, the first proxy for low ex ante bargaining power is if a hospital is a stand-alone facility. Around 25% of the hospitals in my sample lack a partnership with other hospitals, and they are represented by the indicator variable *NoSystem*. When calculating market share it is important to calculate their market power based on their system affiliation.[25] *MktShare* is defined as the number of staffed beds within the system scaled by the total number of staffed beds within the MSA.[26] This measure of monop-

[23]Given the unique partnership structure the health care literature controls for a hospital's status in empirical work. I also do so to ensure these universities relationship with hospitals does not affect their choice of leverage and the reimbursement rates they are able to request.

[24]The exact calculation is two thirds of the fee scheduled scaled by the adjustment factor plus one third of the unscaled base rate.

[25]Unfortunately, system affiliation is backfilled by AHD and I use their saved references to correct changes in affiliation throughout the sample.

[26]This is the standard measure of market power used in the health care literature.

sony power is the second measure I use for the ex ante bargaining power of a hospital. Vast differences exist in the hospital markets as some are dominated by a single system of hospitals and others consist of a dispersed group of hospitals with smaller market shares. These differences can be observed in the fact that the average *MktShare* is 22% and yet more than 10% of the hospitals have a market share greater than 50%, while an equal amount have market shares less than 2%.[27] I split hospitals into two groups based on the median market share within each MSA-year and smaller hospitals are the lower bargaining power group.

The third measure of low bargaining power is if a hospital is located outside a MSA. Approximately 30% of hospitals with sufficient financial data are located outside MSAs and these areas tend to have only one insurer and one hospital system, whereas bigger cities might have 30 hospitals and three main insurers. The bilateral monopoly should lead to more bargaining power for hospitals relative to urban areas where they are competing with more hospitals and a similar number of insurers. The fourth measure of bargaining power is based on the number of hospitals within a MSA. Hospitals have lower bargaining power if there are above median number of hospitals within that year (overall sample median of 9).[28] Increased horizontal competition lowers the bargaining power of hospitals. The fifth measure of ex ante hospital bargaining power is based on the local market concentration of the insurance companies.

[27]This difference is not simply rural versus urban areas because all hospitals are located in MSAs.

[28]Similar results can be found using the number of hospital systems as an alternative.

A firm's bargaining power is higher when dealing with dispersed stakeholders because of the price pressure from the horizontal market. *HHI_Insurer* is the Herfindahl-Hirschman Index of insurance companies as reported in the annual AMA reports for each metropolitan area. I classify low bargaining power hospitals to be those located in a MSA with insurer concentration above 0.25.[29]

The sixth measure, *Laws*, is arguably the most exogenous from the hospital's perspective and it requires some explanation. Most FFS Medicare enrollees purchase a supplemental Medigap policy to limit the potentially unlimited out-of-pocket risk stemming from co-payments. While Medicare is primarily for individuals 65 and older, approximately one in six enrollees is a younger person eligible because of a disability or End-State Renal Disease (ESRD).[30] These individuals tend to require more care, are more expensive, and therefore, without restriction insurance companies would charge them more than older individuals for Medigap policies.[31] However, 17 states require insurance companies to price Medigap policies identically for enrollees without regard to age.[32]

This mandated equality of premia effectively acts as a tax on the insurance companies in their pricing of Medigap policies, which effectively transfers

[29]According to the 2010 Horizontal Merger Guidelines published by the DOJ and FTC, this is the cutoff for classification of extremely concentrated markets.

[30]http://www.medicareresources.org/basic-medicare-information/what-is-medicare/

[31]See CMS's 2014 "Choosing a Medigap Policy" p.40.

[32]These states are: Connecticut, Hawaii, Illinois, Kansas, Massachusetts, Maryland, Maine, Minnesota, New Hampshire, New Jersey, New York, Oregon, Pennsylvania, and South Dakota.

part of the surplus from the hospital-insurer relationship to the younger more expensive individuals, similar to precommiting part of the surplus to creditors. The transfer increases the bargaining power of the insurance companies and weakens the ex ante bargaining power of the hospital. Therefore, if hospitals use debt to enhance bargaining power, the strategic benefits of debt in these states should be greater and the hospitals should operate with more leverage than those in other states, other things being equal. The orange states in Figure 2.2 are the ones with these laws.

One potential concern with treating these differences in laws as exogenous is that it imposes a geographical slant toward states in the Northeast. I attribute this geographical difference to a propensity for public policies that provide more for the disadvantaged in these states. Thus a concern arises with using these laws as exogenous variation in ex ante bargaining power because factors could be correlated with both hospital capital structure and negotiated prices between hospitals and insurance companies, unrelated to the bargaining benefits of leverage, that differ systematically across regions. However, It is unclear and difficult to articulate what these differences might be and how they would ultimately affects the results.[33]

Table 2.2 contains a cross-correlation matrix for the primary variables of interest. The bargaining power measures have relatively low pairwise correlation coefficients ranging from -0.2 to 0.45. There low correlations are beneficial

[33]I would like to do a matching exercise with these states, but unfortunately, the clustering causes a problem similar states without these laws nearby.

to the analysis for two reasons. First, the multiple proxies capture different components of a latent bargaining power measure. Second, these are distinct cuts of the data, which this shows the robust nature of the findings. The remaining variables have low correlations with one another with the exception of two pairs. *GeoAdjFactor* has a correlation with *AvPayment* that is extremely high, 0.756, because it is the primary factor to adjust for regional differences in cost of care. The correlation between *NumBeds* and *CapEx* is 0.343 as this is the primary investment that hospitals make.

In order to better understand the features of this unique setting I present summary statistics for the variables measured at the MSA level for years 2008, 2010, and 2012 in Table 2.3. *MedianLev* is the median hospital leverage within each MSA and has declined from its peak in 2008 during the financial crisis. *MedianPay* and *MedianCost* are defined as the median annual payments and costs within each MSA and have each been increasing over the sample period. I include year fixed effects in all regressions, which ensures all of the identification comes within a year and helps eliminate spurious time trends. The number of MSAs in the sample increases over time because the AMA has included more areas in each edition of its studies.[34] The distribution of corporate type and the number of hospitals is fairly constant over the sample period.

Summary statistics for the sample by corporate type can be found in

[34]Results are robust to specifications requiring that each MSA be present for all studies.

Table 2.4. For-profit hospitals are the smallest, have less-volatile earnings, are more likely to be a part of the system, have lower leverage, have the lowest costs and receive smaller payments. Nonprofit and government hospitals are similar along most dimensions including size, costs, payments, income volatility, and capital expenditures. Nonprofit hospitals have the highest leverage because they issue more long-term debt. Government hospitals are more likely to be located in rural areas.

Firm leverage and market competition measures tend to be sticky in the short term which may affect the power of within firm tests given the five-year sample. In order to test if this is a concern, Table 2.5 contains a variance decomposition of *Leverage*, *AvPayment*, *MktShare*, *NoSystem* and *Insurer_HHI* by group (hospital, MSA, system affiliation, year, and state). The results show how much of the variation for each variable is explained by the differences within a group as opposed to between groups. The within firm variation in leverage and average payments is one third to one half of the variation across firms and this difference is even larger for the market competition measures. The lack of within hospital variation limits the power of fixed effects regressions that rely on within firm variation.[35]

[35]The lack of within firm variation for the market concentrations measures is unsurprising and only limits the power of the leverage regressions.

2.4 Results

The empirical analysis consists of four parts. I test each of the hypotheses developed in Section 2.2. First, I investigate whether hospitals with more leverage receive higher reimbursement rates from insurers by estimating equation (2.1). I then use the cross-sectional variation from this setting to test if this effect is stronger when hospitals have weaker ex ante bargaining power. Next, I use changes in capital structure and differences in corporate status' to rule out alternative non-bargaining explanations. Finally, I look for evidence that hospitals are more apt to use debt to gain bargaining power when they lack ex ante bargaining power by estimating equation (2.2).

2.4.1 Benefits of Leveragem

Table 2.6 presents a series of regressions based on equation (2.1) to test the hypothesis that debt improves bargaining outcomes. The dependent variable in each regression is a hospital's average negotiated colonoscopy price for the year. All specifications include year fixed effects and $GeoAdjFactor$, Medicare's geographical price adjustment, which has a major impact on price variation across metropolitan areas. Standard errors are clustered at the hospital level and *Leverage* is the variable of interest. Column 1 is the baseline regression without additional controls. Column 2 contains other hospital controls as described in Table 1 and Column 3 contains additional MSA controls. Finally, Column 4 includes hospital fixed effects. Standard errors in this and all later tables are shown in parentheses below the point estimates, and are

clustered at the hospital level.[36]

In all specifications, the coefficient on leverage is positive, similar in magnitude and statistically significant. This shows that firms with higher leverage do in fact receive better negotiation outcomes. Using the coefficient estimates in the fourth column with hospital fixed effects, a hospital with a one standard deviation increase in leverage, ceteris paribus, receives $1.83 (=.361*5.057) more per procedure performed. Hospitals and insurance companies effectively bargain over surplus - i.e., the value created after taking into account the costs of performing a procedure. One back of the envelope way to measures the magnitude is by examining the average hospital profit (payment received minus cost) per colonoscopy performed, which is $36.07. Thus a $1.83 increase in payment received translates into approximately a 5% increase in profit per procedure.

Moreover, the estimates of the impact of leverage on reimbursement rates likely represent a lower bound on the average impact across all procedures for two reasons. First, unlike most other procedures (e.g., heart surgeries), colonoscopies are sufficiently straightforward that they can be performed at outpatient clinics, which then compete with hospitals in performing them. This competition drives prices down and limits the scope for bargaining for these procedures.[37] Also, variation is smaller for FFS Medicare patients be-

[36]The same results with *NetLeverage* as the independent variable of interest can be found in Appendix table A.1.

[37]Hospital executives with whom I had conversations make this argument.

cause the fee schedule and *GeoAdjFactor* are set by the panel of physicians, limiting the portion of the procedure that is bargained over to supplemental payments, whereas they bargain over the entire reimbursement rates for regular patients. In addition, the true economic magnitude for the hospital would be determined by summing over each of the 7,000 procedures in which hospitals and insurance companies negotiate reimbursement rates.

The coefficient on *GeoAdjFactor* is very large and has a t-statistic above 60 because it is the index used to adjust prices between MSAs. If I include it as the only independent variable in this regression, it explains over 50% of the variation in payments.[38] There are still differences in cost that are not being captured by this index, as is evident from the positive and statistically significant coefficient on *AvCost*. In addition, teaching hospitals, hospitals with more staffed beds and those that perform more procedures receive higher average reimbursement rates, ceteris paribus.[39,40]

[38]Coefficients from these regressions are similar with alternative specifications including scaling *AvPayment* by *GeoAdjFactor*, calculating a residual payment relative to the expected local payment and including a squared *GeoAdjFactor* term. These results can be found in Appendix table A.2.

[39]The coefficient on *MktShare* in the fourth column with hospital fixed effects is negative and statistically significant, contrary to standard economic theory. Upon further examination, there are approximately 20 hospitals that were acquired by large systems and see substantial changes in their *MktShare*. If I exclude these hospitals this relation no longer exists. Further, the coefficient on *Leverage* actually increases, providing further robustness that the main result is not driven by these outlier observations.

[40]Another concern with many of the hospitals being part of a large system of hospitals is that hospital specific leverage may not be a good measure of financial constraint because they may be able to receive capital from a hospital partner that has a stronger balance sheet. To help rule this concern out I run all of the regressions at the hospital system level with *AvPayment*, *Leverage*, *MktShare*, and *AvCost* measured on either an equal or value weighted basis. In fact, the coefficients on *Leverage* are larger and can be found in Table

Of course this result alone does not imply a causal interpretation that debt improves bargaining power because there are a variety of reasons why reimbursement rates and hospital leverage may be correlated. For example, hospitals may use more debt to alleviate moral hazard problems and ensure their executives exert higher effort during negotiations, which leads to better bargaining outcomes. Alternatively, hospitals may issue debt and use the proceeds to improve the quality of their facilities, which enables them to charge higher rates. This is also consistent with reverse causality, where the firms that are the best at negotiating are the most profitable and therefore, have the greatest need for a debt tax shield.

In order to provide further evidence this result is due to bargaining power as opposed to these other possibilities, I test the second prediction that the bargaining benefits of leverage are larger when a hospital has lower ex ante bargaining power. In order to test this, I split the hospitals between those that have higher and lower ex ante bargaining power and estimate equation (2.1) separately for each group. Specifically, I split the hospitals into two groups using six different proxies: *NoSystem*, *MktShare*, *Rural*, *NumHosp*, *HHI_Insurer*, and *Laws*. Definitions of all of these proxies can be found in the data section. Table 2.7 shows the cross sectional results from repeating the regressions estimated in Table 2.5 with *Leverage* as the independent variable of interest.[41]

A.3

[41]The corresponding table with *NetLeverage* as the independent variable of interest and using hospital fixed effects can be found in Tables A.4 and A.5, respectively

Each of the columns are paired with the high ex ante bargaining power groups in the odd columns, while the low ex ante bargaining power groups are in the even columns. Using all six proxies, the coefficients on *Leverage* are only statistically significant different than 0 for hospitals with low ex ante bargaining power and the magnitudes are two to five times higher for these subsamples than those for the full sample in the previous table. Further, the coefficients for the low ex ante bargaining power subsamples are statistically different than the high ex ante bargaining power subsamples when the sample is split on system status (p-value of 0.026), hospital market share (p-value of 0.009), and rural versus urban (p-value of 0.012).

In order to further examine the magnitude for these groups I plot the coefficients for *Leverage* from the cross sectional regressions based on equation (2.1) in Figure 2.3. The first black line shows the coefficient for the regression based on all hospitals (Column 3 from Table 2.6). The remaining lines split the hospitals based on the six measures of ex ante bargaining power, with the red lines being the hospitals with lower bargaining power and the blue lines being the counterparts with higher bargaining power (coefficients from Table 2.7). This figure helps to show magnitude difference in the bargaining benefits of debt for the subset of hospitals that lack ex ante bargaining power.

These results bolster the interpretation that the leverage affects bargaining power because there is no reason to believe this relationship is stronger for hospitals that lack ex ante bargaining power if the effect was driven by managerial effort, tax motives or an increase in capital expenditures. Of course

there are several other concerns that need to be considered. In particular, one concern is that price differences are not driven by bargaining and instead are due to differences in care. The primary reason that I use a straightforward homogeneous procedures with little clinical variation is to control for such concerns. In addition, I control for the average hospital cost for these procedures and the results hold in the presence of hospital fixed effects. Another concern with using a sample during the financial crisis is that reimbursement rates could have a mechanical relationship with the macro economy. The use of year fixed effects in all regressions should account for the effects of any time variation in aggregate prices with the identification coming from the cross section.

It is possible that hospitals with lower bargaining power for the more endogenous measures, like whether they are part of a system, may choose to increase investment to improve their reimbursement rates rather than merging with another hospital. I attempt to control for this possibility directly by including *CapEx* in all pricing regressions regressions. To further rule out this concern, I split the hospitals depending on if they had and increase long-term liabilities, assets, neither or both from the previous year. Under the investment alternative this effect should be driven entirely by the hospitals that have increased both their long-term liabilities and assets or only increased their total assets. These cross-sectional tests can be found in Table 2.8.[42]

[42]Corresponding tables using *NetLeverage* and hospital fixed effects can be found in Tables A.6 and A.7, respectively.

The coefficient on *Leverage* is only statistically significant in Columns 3 and 4 when long-term liabilities had increased from the previous year. Further, the coefficient for the regression when only long-term liabilities increased is larger than the column in which both liabilities and assets have increased. These results do not support the notion that the results are driven by capital expenditures instead of the bargaining hypothesis.

Another potential concern about the price-leverage relation arises from tax-based motives for the use of debt. Taxes are among the most important determinants of capital structure decisions. Tax motives could drive a positive relation between leverage and prices for two reasons. First, there may be a reverse causality concern because, holding costs and volume fixed, higher prices imply higher income, increasing the benefits of debt tax shields. Second, manager skill may be an omitted variable in that more skilled hospital managers might both be able to negotiate higher prices and choose to operate with higher leverage in order to obtain more tax shields.

This concern is partially alleviated given the effect of leverage continues to hold with hospital fixed effects and further, there is no reason to expect these tax based incentives would be stronger for the hospitals that lack ex ante bargaining power. I bolster the evidence against this concern by exploiting a unique feature of the health care industry, the presence of both for-profit and nonprofit hospitals. For-profit hospitals pay federal and state corporate income taxes, just as any other for-profit corporation does. Nonprofit hospitals, on the other hand, are not subject to state or federal taxes. That being said,

nonprofits can borrow at a cheaper rate because any debt they issue provides abatement at the personal level. In addition, any debt issuance would nonprofits are subject to a "project financing rule," which requires these hospitals to issue debt only when they have the capital earmarked for a specific investment. While this could be useful under the alternative investment hypothesis, nonprofits would have no way to take advantage of a traditional debt tax shield. Therefore, if tax shields incentives drive the observed relation between payments and leverage, this relation should only be observed among for-profit hospitals.

I estimate equation (2.1) for subsamples consisting of for-profit and not-for-profit hospitals separately, along with hospitals that switch from nonprofit to for-profit hospitals during my sample. Table 2.9 presents the cross sectional results.[43]

Column 1 shows the results in for-profit hospitals, Column 2 shows the results for nonprofit hospitals and Column 3 shows hospitals that switch during the sample. Contrary to tax motives driving the relation between payments and leverage, the relation actually holds only among nonprofit hospitals. The relation between pricing and leverage in nonprofit hospitals is difficult to reconcile with alternative explanations based on tax motives. The fact that bargaining benefits only appear in nonprofit hospitals for the cross-sectional tests brings up its own potential issues. The fact this relation does not exist

[43]The corresponding results using *NetLeverage* can be found in Table A.8, while results using hospital fixed effects can be found in Table A.9.

in for-profit hospitals may be because the number of for-profit hospitals in my sample is relatively small, raising concerns about power. In addition, for-profit hospitals are more likely to be in a large system of hospitals, which would strengthen their ex ante bargaining power. With more bargaining power, the bargaining benefits of debt are reduced and so these hospitals are also predicted to be less likely to use strategic leverage.

One way to examine the different incentives in for-profit and nonprofit hospitals is to look when they switch corporate type. In my sample, there were 40 hospitals that switched between nonprofit and for-profit hospitals, with all of them switching to for-profit in some sort of merger. These nonprofit hospitals had higher leverage ratios than other nonprofit hospitals before switching corporate type and the use of debt increased after the merger, despite the total debt in the sample decreasing over time. In some instances for-profit chains were participating in a leveraged buyout of these nonprofit hospitals and so one might expect the effect of leverage on negotiation outcomes to be stronger in this subset. Column 3 shows the results and the coefficient on *Leverage* cannot be distinguished from zero, though power is definitely an issue with only 161 observations.

There are other differences worth noting between for-profit and nonprofit hospitals, specifically nonprofit hospitals have no equity holders. This may reduce their profit maximizing motives or change their financial incentives in other ways. There is extensive literature that suggests that nonprofit hospitals act similarly to for-profit hospitals along a number of dimensions. After

controlling for size and patient type, Wedig (1988) finds no difference in capital structure by corporate type. Bowman (2002) finds nonprofit hospitals borrow more when they receive endowments, consistent with optimizing leverage as if they follow the trade-off theory of capital structure. Similarly, Wedig et al (1996) model and find evidence that nonprofit hospitals issue debt until the point that benefits are offset by agency and bankruptcy risk. Lastly, Duggan (2002) uses responses to changes in regulation and finds nonprofit hospitals respond similarly to for-profit hospitals. It is also worth noting that nonprofits are legally required to provide free care to some patients, and thus are forced to bargain aggressively with insured patients to ensure they make up for lost resources and remain a going concern.[44]

2.4.2 Predicting Use of Leverage

The literature on the bargaining benefits from debt documents a relationship between leverage and unions. Recently, Matsa (2010) uses exogenous variation in right to work laws to show firms tend to have higher leverage when unions are strongest or in other words, the bargaining benefits are greater. I seek confirmation of this result and test the third prediction in the health care setting by testing whether hospitals with lower ex ante bargaining power, proxied for by a lower market share, a lack of partnerships with other hospitals, more competing hospitals, dealing with more concentrated insurers markets,

[44]This argument was made during an interview I had with an executive for a nonprofit hospital.

and operating in a state with laws on supplemental insurance policies, have higher leverage.

Specifically, using equation (2.2), a positive coefficient on *NegMktShare*, *NoSystem*, *NumHosp*, *HHI_Insurer*, *NoSystem* and *Laws* would be consistent with the prior literature and the third prediction. Results are shown in Table 2.10. All specifications include year fixed effects and standard errors clustered at the hospital level. *Leverage* is the dependent variable. Column 1 contains the baseline univariate regression, Column 2 includes additional controls and Column 3 includes hospital fixed effects.[45]

In cross-sectional specifications, the coefficients of interest are positive consistent with hospitals that have weaker ex ante bargaining power taking on more leverage and the coefficients on *NoSystem*, *Laws* and *NumHosp* are all statistically significant at the 1% level. Using the cross-sectional coefficients from the second column with all of the controls, I find that, ceteris paribus, a one standard deviation increase in the number of hospitals in the local market would increase leverage by 0.031 (=20.9x0.0015) from a mean of 0.3. Ceteris paribus, a partnership with other hospitals has 0.06 lower leverage than a stand-alone hospital. Finally, a hospital in states without pooling laws tend to have .063 lower leverage than hospitals in states without these laws. Each of these results is consistent with hospitals using more leverage when they lack ex ante bargaining power.

[45]The corresponding Table using *NetLeverage* can be found in Table A.10.

In the final column with hospital fixed effects the only measure of bargaining power that is statistically significant is *NegMktShare* and the coefficient is actually larger. *SamePremium* is omitted because the laws are not time-varying from 2008-2012. *NoSystem* and *HHI_Insurer* continue to be the weakest variables in specifications with hospital fixed effects because there is relatively little variation in the time series.

2.5 Conclusion

In this paper, I use a novel setting, the health care industry, to test the bargaining benefits from debt during negotiations with a firm's non-financial stakeholders. In testing this theory, existing empirical evidence has relied on indirect evidence that leverage is higher when negotiating with strong stakeholders, for example unions. There is a lack of direct evidence that leverage effects negotiation outcomes because negotiation outcomes are rarely observed, especially for a broad cross-section of firms. I find that hospitals with more leverage receive higher reimbursement rates for a homogeneous procedure (colonoscopies) and this is the first direct evidence that firms receive better bargaining outcomes when they have higher leverage.

Given that there are costs associated with debt, trade-off theory predicts that leverage is more likely to be used to enhance bargaining power when the benefits are greatest, specifically when a firm otherwise lacks bargaining power. Consistent with this notion, I find negotiation outcomes are more sensitive to leverage for subsets of hospitals that have lower ex ante bargaining

power; stand-alone hospitals, those with a below-median market share, urban hospitals, those that operate in markets with above median hospitals, hospitals that operate in a market with an insurer HHI above 0.25 and if hospitals are located in states with Medigap pooling laws.

These results help to rule out alternative capital expenditure or tax-based explanations for this effect. In order to further rule out a capital expenditure explanation, I show the coefficient on leverage continues to be significant despite no increase in hospital assets. Further, I show the bargaining benefits from debt exist for nonprofit hospitals, which helps to alleviate concerns that the relationship between leverage and bargaining outcomes is driven by tax motives. Lastly, I confirm capital structure decisions of these hospitals are consistent with the prior literature by showing leverage is decreasing in a firm's ex ante bargaining power. I find hospital leverage is negatively related to a hospital's market share, lower when the hospital is a member of a system, higher if they compete against more hospitals and higher if they are in a state with pooling insurance premium requirements. I conclude this is direct support for the bargaining benefits of debt during negotiations with a firm's non-financial stakeholders.

Table 1.1: Hospital Assets

This table contains the total hospital assets in the U.S. by corporate type from 1947 until 1977.

Year	Nonprofit	Government	For profit	Total
1947	2697	612	129	3439
1950	3350	861	138	4349
1955	5223	1614	148	6985
1960	8422	2193	243	10858
1965	12476	3474	414	16364
1970	20502	5301	871	26674
1975	35827	8890	2538	47256
1977	46686	10953	3494	61133

Table 1.2: Hospitals by Corporate Type

This table contains the total number of hospitals and corresponding percentage by corporate type from 1946 until 2009 in the U.S..

Year	Total	Nonprofit	For Profit	Government	% Nonprofit	% Profit	% Govt
1946	4445	2584	1076	785	58.13%	24.21%	17.66%
1950	5031	2871	1218	942	57.07%	24.21%	18.72%
1955	5237	3097	1020	1120	59.14%	19.48%	21.39%
1960	5407	3291	856	1260	60.87%	15.83%	23.30%
1965	5736	3426	857	1453	59.73%	14.94%	25.33%
1975	5875	3339	775	1761	56.83%	13.19%	29.97%
1980	5830	3322	730	1778	56.98%	12.52%	30.50%
1990	5834	3191	749	1444	54.70%	12.84%	24.75%
1995	5194	3092	752	1350	59.53%	14.48%	25.99%
2000	4915	3003	749	1163	61.10%	15.24%	23.66%
2009	5008	2918	998	1092	58.27%	19.93%	21.81%

Table 1.3: Insurance Coverage

This table contains the U.S. population, percent covered by insurance, and percent covered by Blue Cross by year from 1940 until 1986.

Year	Population	% Insurance	% BC
1940	132.5	9	50.3
1945	133.4	24	58.9
1950	152.3	50.3	50.7
1955	165.9	61.1	50
1960	180.7	67.8	47.4
1965	194.3	71.4	45.7
1970	205.1	77.5	47.2
1975	216	82.5	48.5
1980	227.8	82.3	46.3
1986	241.6	74.4	43.4

Table 1.4: System vs Independent Hospitals

This shows the number of independent and system-based hospitals between 1999 and 2010 as reported in the Dixon Hughes Goodman 2013 Winter Healthcare report.

Year	Independent Hospitals	System Hospitals
1999	2432	2524
2000	2373	2542
2001	2328	2580
2002	2321	2606
2003	2269	2626
2004	2251	2668
2005	2220	2716
2006	2172	2755
2007	2167	2730
2008	2142	2868
2009	2087	2921
2010	2044	2941

Table 1.5: Funding Source

This table shows the funding source for nonprofit hospitals between 1968 and 1981.

Funding Source	1968	1973	1978	1981
Philanthropy	21	10	6	4
Govt	23	21	16	12
Internal Reserves	16	15	17	15
Debt	38	54	61	69

Table 1.6: Summary Stats by Corporate Type 2012

This table contains the summary statistics for the relevant variables at the MSA level. Panel A contains summary statistics from 2008, B from 2010, and C from 2012. *PctProfit* is equal to the percentage of all hospitals that are for-profit hospitals, *PctNonprofit* is equal to the percent of hospitals that are nonprofit, and *PctGovt* is the percent of hospitals that are government hospitals. *MedianPay* is the median reimbursement rate that hospitals receive in the MSA. *MedianCost* is the median cost that hospitals pay for colonoscopies in the MSA. *MedianLev* is the median leverage of each hospital in the respective MSA. *HHI_Insurer* is the Herfindahl-Hirschman Index for both HMO and PPO insurance participation published by the American Medical Association.

A: Profit	count	mean	p50	sd	p10	p90
Leverage	437	0.113	0.032	0.605	-1.009	0.892
HHI_Insurer	313	0.300	0.266	0.121	0.198	0.433
CapEx	437	7.415	2.444	34.311	-7.290	32.992
Total Staffed Beds	437	179.201	139.000	154.447	39.000	373.000
MktShare	437	0.273	0.150	0.315	0.010	1.000
NetIncomeVol	437	6.983	3.819	9.025	0.947	15.358
Teaching	437	0.160	0.000	0.367	0.000	1.000
HHI_Hospital	437	0.320	0.228	0.296	0.045	1.000
NoSystem	437	0.142	0.000	0.349	0.000	1.000
NetIncomeAssets	437	0.088	0.091	0.858	-0.095	0.440
B: Nonprofit	count	mean	p50	sd	p10	p90
Leverage	1432	0.320	0.299	0.273	0.004	0.652
HHI_Insurer	1070	0.287	0.262	0.096	0.194	0.396
CapEx	1432	14.945	5.101	42.576	-12.811	57.529
Total Staffed Beds	1432	262.622	196.500	229.924	60.000	543.000
MktShare	1432	0.328	0.203	0.331	0.011	1.000
NetIncomeVol	1432	13.285	6.750	16.103	1.630	35.211
Teaching	1432	0.326	0.000	0.469	0.000	1.000
HHI_Hospital	1432	0.330	0.218	0.311	0.045	1.000
NoSystem	1432	0.290	0.000	0.454	0.000	1.000
NetIncomeAssets	1432	1535.525	0.045	58103.693	-0.046	0.146
C: Government	count	mean	p50	sd	p10	p90
Leverage	328	0.282	0.257	0.228	0.003	0.604
HHI_Insurer	178	0.315	0.264	0.147	0.194	0.470
CapEx	328	17.370	2.925	47.519	-5.347	81.254
Total Staffed Beds	328	233.259	153.000	229.974	47.000	572.000
MktShare	328	0.419	0.284	0.398	0.002	1.000
NetIncomeVol	328	10.750	3.574	16.294	0.816	30.296
Teaching	328	0.241	0.000	0.428	0.000	1.000
HHI_Hospital	328	0.428	0.296	0.367	0.004	1.000
NoSystem	328	0.668	1.000	0.472	0.000	1.000
NetIncomeAssets	328	0.025	0.023	0.098	-0.047	0.097

Table 1.7: Summary Stats by System 2012

This table contains the summary statistics for the relevant variables at the system level. Panel A contains summary statistics from stand-alone hospitals and B for hospitals part of a system. All variable definitions can be found in 2.1

A: Stand-alone	count	mean	p50	sd	p10	p90
Leverage	696	0.327	0.310	0.218	0.057	0.610
HHI_Insurer	390	0.303	0.266	0.117	0.201	0.445
CapEx	696	9.737	2.540	27.809	-6.901	32.199
Total Staffed Beds	696	183.167	133.000	158.349	44.000	414.000
MktShare	696	0.341	0.101	0.398	0.002	1.000
NetIncomeVol	696	8.022	3.403	12.053	0.835	21.859
Teaching	696	0.185	0.000	0.389	0.000	1.000
HHI_Hospital	696	0.402	0.272	0.359	0.004	1.000
NetIncomeAssets	696	0.033	0.029	0.177	-0.047	0.111
B: System	count	mean	p50	sd	p10	p90
Leverage	1501	0.248	0.245	0.418	0.000	0.722
HHI_Insurer	1171	0.290	0.262	0.105	0.194	0.410
CapEx	1501	15.697	5.163	47.012	-13.028	63.609
Total Staffed Beds	1501	268.761	197.000	237.755	61.000	561.000
MktShare	1501	0.326	0.214	0.312	0.024	0.958
NetIncomeVol	1501	13.337	6.876	16.178	1.760	35.450
Teaching	1501	0.324	0.000	0.468	0.000	1.000
HHI_Hospital	1501	0.315	0.216	0.295	0.045	0.919
NetIncomeAssets	1501	1464.953	0.054	56752.487	-0.060	0.228

Table 2.1: Summary Stats

This table contains the summary statistics for the relevant variables. *Leverage* is the book value of leverage for the hospital defined as total long term liabilities scaled by total assets. *NetIncomeAssets* is the annual net income of the hospital scaled by total assets. *PctOver45* is the percent of people in the local MSA that are age 45 and older as reported in the 2010 census. *NumBeds* is the number of staffed beds within the hospital, a common measure of hospital size. *MktShare* is the total number of staffed beds within the system MSA scaled by the total number of beds within the MSA. *NoSystem* is an indicator variable equal to one if the hospital is not part of a hospital system and zero otherwise. *HHI_Insurer* is the Herfindahl-Hirschman Index for both HMO and PPO insurance participation published by the American Medical Association. *NonProfit* is an indicator variable equal to one if it is equal to one if it is an accredited teaching hospital. *Profit* is an indicator variable equal to one if the hospital is a for-profit corporation. *Government* is a dummy variable equal to one if the hospital is a government hospital. *CapEx* is the different in total assets from the previous year. *NetIncomeVol* is the annual hospital volatility of net income in millions. *Teaching* is an indicator variable equal to one if the hospital is a teaching hospital. *AvPayment* is the average annual payments received from all parties for colonoscopies performed on Medicare patients. *AvCost* is the average annual cost reported by the hospital for colonoscopies past year. *NumProcedures* is the number of colonoscopies performed by the hospital in that year. *GeoAdjFactor* is the adjustment published by the centers for Medicare and Medicaid to adjust payments for differences in cost of living. *NumHosp* is the number of hospitals in the MSA that year. *Laws* is an indicator if the hospital is located in states that have pooling Medigap restrictions. All continuous variables are winsorized at the 1% level.

	count	mean	p50	sd	p10	p90
Leverage	6685	0.303	0.303	0.361	0.000	0.693
NetIncomeAssets	6685	0.128	0.040	4.043	-0.059	0.186
PctOver45	6685	39.39	39.90	4.93	32.80	44.90
NumBeds	6685	298.03	233.00	250.73	68.00	602.00
NonProfit	6685	0.704	1.000	0.456	0.000	1.000
Profit	6685	0.174	0.000	0.379	0.000	1.000
Government	6685	0.122	0.000	0.327	0.000	1.000
CapEx	6685	14.515	3.197	31.58	-11.59	65.00
NetIncomeVol	6685	14.49	7.92	16.59	1.96	37.88
Teaching	6685	0.369	0.000	0.482	0.000	1.000
AvPayment	6685	515.19	509.20	56.73	446.92	596.16
AvCost	6685	479.12	431.13	223.87	238.39	791.33
NumProcedures	6685	87.26	51.00	106.83	16.00	197.00
NoSystem	6685	0.248	0.000	0.432	0.000	1.000
MktShare	6685	0.226	0.155	0.230	0.016	0.537
HHI_Insurer	6685	0.315	0.277	0.131	0.201	0.469
GeoAdjFactor	6685	1.001	0.964	0.115	0.891	1.195
NumHosp	6685	17.007	9.000	20.899	2.000	58.000
Laws	6685	0.304	0.000	0.460	0.000	1.000

Table 2.2: Correlations

This table contains the summary statistics for the relevant variables. All variable definitions can be found in Table 2.1

Variables	Leverage	HHI_Insurer	NetIncomeAssets	MktShare	NoSystem	CapEx	NumHosp	Laws	AvPayment	AvCost	GeoAdjFactor
Leverage	1.000										
HHI_Insurer	0.007	1.000									
NetIncomeAssets	-0.031	0.002	1.000								
MktShare	-0.076	0.201	0.001	1.000							
NoSystem	0.095	0.040	-0.012	-0.182	1.000						
CapEx	-0.012	-0.055	-0.004	0.066	-0.055	1.000					
NumHosp	0.134	-0.057	-0.021	-0.450	-0.040	0.081	1.000				
Laws	0.166	-0.035	-0.021	-0.180	0.084	0.064	0.458	1.000			
AvPayment	0.113	-0.240	-0.013	-0.187	0.017	0.146	0.336	0.315	1.000		
AvCost	0.124	-0.078	-0.016	-0.088	0.069	0.068	0.206	0.228	0.320	1.000	
GeoAdjFactor	0.130	-0.270	-0.012	-0.251	0.006	0.111	0.394	0.365	0.757	0.303	1.000

Table 2.3: Summary Stats by MSA

This table contains the summary statistics for the relevant variables at the MSA level. Panel A contains summary statistics from 2008, B from 2010, and C from 2012. *PctProfit* is equal to the percentage of all hospitals that are for-profit hospitals, *PctNonprofit* is equal to the percent of hospitals that are nonprofit, and *PctGovt* is the percent of hospitals that are government hospitals. *MedianPay* is the median reimbursement rate that hospitals receive in the MSA. *MedianCost* is the median cost that hospitals pay for colonoscopies in the MSA. *MedianLev* is the median leverage of each hospital in the respective MSA. *HHI_Insurer* is the Herfindahl-Hirschman Index for both HMO and PPO insurance participation published by the American Medical Association.

Panel A: 2008	count	mean	p50	sd	p10	p90
HHI_Insurer	274	0.382	0.339	0.162	0.218	0.606
MedianPayment	274	465.46	454.45	44.33	422.43	518.07
MedianCost	274	413.85	386.39	151.48	246.93	612.57
MedianLev	274	0.203	0.199	0.176	0.006	0.420
TotalHospitals	274	10.71	5.000	16.98	2.000	26.00
PctGovt	274	0.204	0.101	0.274	0.000	0.646
PctProfit	274	0.161	0.084	0.209	0.000	0.436
PctNonProfit	274	0.635	0.731	0.325	0.000	1.000
Panel B: 2010	count	mean	p50	sd	p10	p90
HHI_Insurer	301	0.333	0.303	0.140	0.202	0.506
MedianPayment	301	503.09	492.04	48.25	454.47	564.86
MedianCost	301	441.86	416.83	160.58	271.80	656.79
MedianLev	301	0.221	0.203	0.191	0.002	0.451
TotalHospitals	301	11.46	6.000	18.08	2.000	28.00
PctGovt	301	0.189	0.090	0.260	0.000	0.592
PctProfit	301	0.171	0.105	0.200	0.000	0.435
PctNonProfit	301	0.640	0.723	0.318	0.040	1.000
Panel C: 2012	count	mean	p50	sd	p10	p90
HHI_Insurer	312	0.347	0.316	0.217	0.204	0.523
MedianPayment	312	534.11	522.83	58.67	475.73	609.87
MedianCost	312	467.12	441.56	170.25	280.00	685.07
MedianLev	312	0.176	0.176	0.193	0.000	0.409
TotalHospitals	312	11.33	6.000	17.90	2.000	27.00
PctGovt	312	0.188	0.080	0.258	0.000	0.614
PctProfit	312	0.186	0.107	0.214	0.000	0.478
PctNonProfit	312	0.626	0.691	0.320	0.034	1.000

Table 2.4: Summary Stats by Corporate Type

This table contains the summary statistics for the relevant variables by corporate type. Panel A contains summary statistics by for-profit hospitals, B from nonprofit hospitals, and C from government hospitals. *AvCost* is the average annual cost reported by the hospital for colonoscopies past year. *Leverage* is the book value of leverage for the hospital defined as total long term liabilities scaled by total assets. *HHI_Insurer* is the Herfindahl-Hirschman Index for both HMO and PPO insurance participation published by the American Medical Association. *CapEx* is the different in total assets from the previous year. *Total Staffed Beds* is the number of beds at the hospital that can be used for patients. *MktShare* is the total number of staffed beds within the system MSA scaled by the total number of beds within the MSA. *NetIncomeVol* is the annual hospital volatility of net income in millions. *Teaching* is an indicator variable equal to one if the hospital is a teaching hospital. *NumProcedures* is the number of colonoscopies performed by the hospital in that year. *AvPayment* is the average annual payments received from all parties for colonoscopies performed on Medicare patients. *NoSystem* is an indicator equal to one if it is a stand-alone hospital. All continuous variables are winsorized at the 1% level.

A: Profit	count	mean	p50	sd	p10	p90
AvCost	1160	399.256	363.640	191.998	190.346	637.912
Leverage	1160	0.160	0.104	0.605	-1.009	0.925
HHI_Insurer	1160	0.321	0.273	0.163	0.201	0.483
CapEx	1160	3.495	0.000	18.078	-7.712	17.569
Total Staffed Beds	1160	198.505	169.000	166.651	32.000	400.500
MktShare	1160	0.164	0.100	0.166	0.010	0.374
NetIncomeVol	1160	7.710	5.222	8.798	1.316	16.061
Teaching	1160	0.172	0.000	0.378	0.000	1.000
NumProcedures	1160	54.978	33.000	69.946	14.000	119.500
AvPayment	1160	501.280	497.499	52.094	438.544	567.618
NoSystem	1160	0.151	0.000	0.358	0.000	1.000
B: Nonprofit	count	mean	p50	sd	p10	p90
AvCost	4709	496.895	446.964	227.387	252.904	824.842
Leverage	4709	0.342	0.327	0.281	0.006	0.674
HHI_Insurer	4709	0.308	0.277	0.113	0.202	0.454
CapEx	4709	16.470	5.266	32.857	-13.516	71.197
Total Staffed Beds	4709	316.318	248.000	259.566	86.000	631.000
MktShare	4709	0.235	0.169	0.233	0.018	0.540
NetIncomeVol	4709	15.784	8.997	17.189	2.327	42.018
Teaching	4709	0.406	0.000	0.491	0.000	1.000
NumProcedures	4709	96.958	57.000	117.379	17.000	216.000
AvPayment	4709	520.445	514.250	57.097	450.826	602.958
NoSystem	4709	0.220	0.000	0.414	0.000	1.000
C: Government	count	mean	p50	sd	p10	p90
AvCost	816	490.113	445.480	221.144	264.231	784.924
Leverage	816	0.279	0.270	0.240	0.000	0.568
HHI_Insurer	816	0.347	0.294	0.169	0.201	0.582
CapEx	816	18.899	3.989	35.555	-10.212	100.490
Total Staffed Beds	816	334.001	269.000	263.736	61.000	684.000
MktShare	816	0.262	0.132	0.273	0.017	0.682
NetIncomeVol	816	16.631	8.453	19.022	1.331	45.821
Teaching	816	0.431	0.000	0.496	0.000	1.000
NumProcedures	816	77.194	52.500	70.150	15.000	168.000
AvPayment	816	504.667	498.529	56.142	435.912	581.387
NoSystem	816	0.549	1.000	0.498	0.000	1.000

Table 2.5: Variance Decomposition

This table contains the Variance Decomposition of *Leverage*, *AvPayment*, *MktShare*, *HHI_Insurer* and *NoSystem*. The first two rows show the overall mean and standard deviation while the subsequent rows split the variation by between group and within group. The groups are Hospitals, Metropolitan Statistical Areas, Years, System Affiliations, and States.

Variable	Leverage	AvPayment	MktShare	Insurer_HHI	NoSystem
Overall Mean	0.303	515.2	0.226	0.315	0.248
Overall S.D.	0.361	56.7	0.23	0.13	0.432
Between Hospital	0.361	51.8	0.225	0.12	0.427
Within Hospital	0.13	27.5	0.031	0.054	0.026
Between MSA	0.22	45.5	0.266	0.137	0.323
Within MSA	0.323	33.5	0.121	0.056	0.378
Between Year	0.013	26.7	0.007	0.023	0.006
Within Year	0.361	51.6	0.23	0.129	0.432
Between System	0.134	37.6	0.042	0.036	NA
Within System	0.361	56.4	0.229	0.13	NA
Between State	0.142	39.6	0.126	0.094	0.138
Within State	0.344	39.8	0.214	0.092	0.423

Table 2.6: Payment on Leverage

This table contains regressions with *AvPayment* as the dependent variable with *Leverage* as the independent variables of interest. All columns contain year fixed effects and *GeoAdjFactor* with standard errors clustered at the hospital level. Column two contains additional hospital controls, while column three contains MSA controls. Column four includes hospital fixed effects. All variable definitions are in Table 2.1.

	(1)	(2)	(3)	(4)
	AvPayment	AvPayment	AvPayment	AvPayment
Leverage	4.169***	3.033**	2.791*	5.057**
	(2.82)	(2.03)	(1.85)	(2.49)
GeoAdjFactor	369.3***	361.9***	362.6***	
	(70.08)	(65.77)	(64.98)	
NoSystem		1.701	1.573	-8.854
		(1.12)	(1.04)	(-1.09)
AvCost		0.0119***	0.0113***	0.0200***
		(4.73)	(4.42)	(5.71)
CapEx		0.0144	0.0151	0.00723
		(1.08)	(1.13)	(0.73)
NonProfit		2.080	1.914	-3.032
		(1.13)	(1.02)	(-0.66)
NetIncomeAssets		0.00177	0.00578	0.0141
		(0.05)	(0.16)	(0.95)
NumBeds		0.00293	0.00279	0.00451**
		(1.18)	(1.13)	(2.47)
Profit		-0.387	-0.489	0.600
		(-0.17)	(-0.21)	(0.12)
MktShare		2.782	2.127	-24.08***
		(0.99)	(0.76)	(-3.00)
NumProcedures		0.0124**	0.0120**	-0.00325
		(2.56)	(2.49)	(-0.48)
Teaching		2.109	2.059	
		(1.54)	(1.51)	
NetIncomeVol		-0.0744*	-0.0699*	
		(-1.81)	(-1.70)	
PctOver45			0.174	
			(1.51)	
HHI_Insurer			4.657	-6.180*
			(1.19)	(-1.69)
Year FE	Yes	Yes	Yes	Yes
Hospital FE	No	No	No	Yes
N	6685	6685	6685	6685
adj. R^2	0.744	0.748	0.748	0.654

Table 2.7
Cross-sectional Regressions of Leverage Split on Bargaining Power Proxies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Leverage	1.443	11.89***	-0.126	8.191***	0.935	9.535***	1.383	4.091**	0.886	3.454*	1.010	5.901*
	(0.90)	(2.63)	(-0.07)	(3.07)	(0.21)	(3.75)	(0.64)	(2.05)	(0.37)	(1.92)	(0.59)	(1.76)
AvCost	0.0137***	0.00490	0.0185***	0.00120	0.0330***	0.0588***	0.00953***	0.0111***	0.0147***	0.00992***	0.00563*	0.0173***
	(4.99)	(0.87)	(6.02)	(0.29)	(5.13)	(12.58)	(2.90)	(3.00)	(3.20)	(3.67)	(1.80)	(3.99)
CapEx	0.0170	-0.0262	0.0185	-0.0121	0.209***	0.122***	0.0131	0.0109	0.0160	0.00698	0.00162	0.0214
	(1.14)	(-0.90)	(1.20)	(-0.48)	(3.19)	(4.92)	(0.67)	(0.61)	(0.69)	(0.47)	(0.10)	(0.90)
NonProfit	3.428	0.167	1.780	1.471	12.57***	12.57***	0.806	4.557	2.283	2.090	1.437	4.566
	(1.30)	(0.06)	(0.69)	(0.57)	(3.17)	(3.62)	(0.37)	(1.43)	(0.66)	(1.05)	(0.70)	(0.75)
NetIncomeAssets	0.00149	3.714	0.215***	-0.0162	0.000880***	-0.0744	0.0173	-0.142	-0.184	0.0232	0.0187	-0.517***
	(0.04)	(1.12)	(2.86)	(-0.55)	(4.02)	(-1.10)	(0.42)	(-0.61)	(-0.66)	(0.66)	(0.42)	(-7.68)
NumBeds	0.00259	0.00803	0.00279	0.00811	0.0241	0.000770	-0.00841**	0.00874***	0.00607	0.000100	-0.000955	0.00917**
	(1.00)	(1.07)	(1.09)	(1.13)	(1.25)	(0.16)	(-1.98)	(2.86)	(1.45)	(0.04)	(-0.34)	(1.97)
Profit	0.193	-0.553	0.608	-4.094	1.472	-1.975	-0.186	-1.088	0.447	-0.756	-2.265	9.106
	(0.06)	(-0.13)	(0.20)	(-1.29)	(0.28)	(-0.49)	(-0.07)	(-0.28)	(0.11)	(-0.31)	(-0.90)	(1.35)
GeoAdjFactor	370.4***	361.7***	376.8***	354.4***			358.2***	380.5***	379.3***	355.0***	368.1***	355.8***
	(55.20)	(34.31)	(54.96)	(40.57)			(48.25)	(44.70)	(45.11)	(49.50)	(57.41)	(31.38)
HHI_Insurer	8.340*	-1.204	7.834	1.714			0.735	10.04			12.26***	-14.84
	(1.82)	(-0.14)	(1.62)	(0.26)			(0.16)	(1.36)			(2.66)	(-1.58)
MktShare	1.406	1.777			8.316**	-43.35***	4.497	-6.405	1.381	1.898	-0.819	8.913*
	(0.42)	(0.34)			(2.44)	(-9.45)	(1.35)	(-0.77)	(0.23)	(0.63)	(-0.25)	(1.68)
NumProcedures	0.0119**	0.0139	0.0134**	0.00832	0.0655**	0.0164*	0.0154**	0.0104	0.0172*	0.0109**	0.0216***	0.000481
	(2.37)	(0.94)	(2.35)	(0.97)	(2.40)	(1.73)	(2.17)	(1.54)	(1.89)	(2.13)	(2.98)	(0.07)
Teaching	1.420	4.332	1.801	3.192	12.05**	3.023	1.410	3.448*	0.780	2.851*	3.204**	-0.331
	(0.95)	(1.38)	(1.16)	(1.28)	(2.31)	(1.20)	(0.77)	(1.78)	(0.33)	(1.91)	(2.04)	(-0.13)
NoSystem			0.510	1.682	2.896	-2.459	2.765	-0.833	2.362	1.233	1.800	1.025
			(0.22)	(0.86)	(0.86)	(-0.93)	(1.53)	(-0.31)	(0.90)	(0.75)	(1.02)	(0.38)
N	5026	1659	4126	2559	2943	6884	3472	3235	2519	4341	4651	2034
adj. R^2	0.747	0.753	0.747	0.753	0.293	0.304	0.748	0.732	0.747	0.717	0.719	0.738

In this table consists of subsample regressions split on six bargaining power proxies. All low bargaining power groups are in the even columns, while high bargaining power groups are in the odd columns. Column 1 consists of hospitals in a hospital system, 2 is stand-alone hospitals, 3 is above-median *MktShare* in the MSA-year, 4 is below-median, 5 is rural hospitals, 6 is hospitals in MSAs, 7 is hospitals that have below-median hospitals in their MSA for that year, 8 is above-median, 9 is hospitals that bargain with insurance companies with an HHI less than 0.25, 10 bargain with those above 0.25, 11 operate in states without Medigap pooling laws, and 12 operate in states with these laws.
This table includes year fixed effects and standard errors are clustered at the hospital level. t-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table 2.8: Subsample Based on Increase in Assets/Liabilities

This table contains regressions with average payment as the dependent variable. All regressions include year fixed effects, controls and standard errors clustered at the state level. Column 1 contains hospitals that did not increase assets or long-term liabilities from the previous year. Column 2 contains hospitals that had an increase in assets with no increase in liabilities. Column 3 contains hospitals that increase liabilities with no increase in assets and Column 4 contains an increase in both assets and liabilities.

	(1) NoIncrease	(2) AssetIncrease	(3) LiabIncrease	(4) BothIncrease
Leverage	0.233	2.643	6.333*	5.108*
	(0.12)	(1.02)	(1.88)	(1.87)
NoSystem	-1.153	1.641	6.105**	2.145
	(-0.51)	(0.84)	(2.11)	(1.03)
AvCost	0.0130***	0.00731**	0.00547	0.0167***
	(2.96)	(2.06)	(1.04)	(4.83)
CapEx	0.0290	-0.00157	-0.0667	0.00962
	(0.36)	(-0.06)	(-0.51)	(0.45)
NonProfit	4.483	2.046	0.901	-0.580
	(1.64)	(0.86)	(0.26)	(-0.20)
NetIncomeAssets	-0.0117	-0.0158	2.872	0.860
	(-0.05)	(-1.18)	(0.59)	(0.40)
PctOver45	-0.000889	0.173	-0.0368	0.355**
	(-0.01)	(1.18)	(-0.14)	(1.99)
NumBeds	0.00212	0.00311	0.00478	0.00341
	(0.76)	(0.88)	(0.83)	(0.82)
Profit	-1.563	2.128	-6.376	-1.321
	(-0.47)	(0.69)	(-1.42)	(-0.36)
GeoAdjFactor	358.8***	370.8***	337.3***	381.0***
	(40.97)	(46.26)	(27.50)	(49.93)
HHI_Insurer	8.734	5.325	-7.276	6.832
	(1.56)	(1.01)	(-0.76)	(1.03)
MktShare	0.725	-2.460	-4.574	8.972**
	(0.16)	(-0.67)	(-0.73)	(2.37)
NumProcedures	0.00860	0.0173**	0.00770	0.0101*
	(0.93)	(2.29)	(0.90)	(1.68)
Teaching	3.682*	0.258	3.233	2.642
	(1.84)	(0.14)	(1.22)	(1.38)
NetIncomeVol	-0.148**	-0.0421	-0.112	-0.0849
	(-2.14)	(-0.75)	(-1.55)	(-1.52)
N	1564	2170	797	2154
adj. R^2	0.725	0.745	0.710	0.766

t statistics in parentheses
* p<.10, ** p<.05, *** p<.01

Table 2.9: Payment on Leverage by Corporate Type

This table contains cross sectional regressions with *AvPayment* as the dependent variable for subsets of hospitals based on their corporate status. Column 1 contains the subset of for-profit hospitals, Column 2 contains nonprofit hospitals and Column 3 contains the hospitals that switched from nonprofit to for-profit during my sample.

	(1) Profit	(2) NonProfit	(3) Switchers
Leverage	-0.0480	4.588**	0.472
	(-0.02)	(2.08)	(0.07)
AvCost	0.0170**	0.0103***	0.00148
	(2.58)	(3.46)	(0.15)
CapEx	0.00937	0.0106	0.0793
	(0.20)	(0.68)	(1.09)
NoSystem	5.778	0.215	3.403
	(1.51)	(0.12)	(0.30)
NetIncomeAssets	1.369	0.000174	0.00771
	(0.60)	(0.01)	(0.01)
PctOver45	-0.0837	0.350**	1.950**
	(-0.33)	(2.50)	(2.53)
NumBeds	-0.000369	0.00288	-0.00904
	(-0.04)	(1.04)	(-0.35)
GeoAdjFactor	391.7***	362.8***	389.9***
	(26.91)	(54.82)	(16.47)
HHI_Insurer	6.687	7.175	29.03
	(0.97)	(1.26)	(0.93)
MktShare	8.956	-1.079	-29.49**
	(1.04)	(-0.32)	(-2.04)
NumProcedures	0.0144	0.0114**	-0.0111
	(1.15)	(2.13)	(-0.38)
Teaching	5.711*	1.363	3.241
	(1.75)	(0.87)	(0.54)
NetIncomeVol	-0.196	-0.0710	-0.0253
	(-0.97)	(-1.54)	(-0.07)
N	1160	4709	161
adj. R^2	0.675	0.754	0.878

t statistics in parentheses
* p<.10, ** p<.05, *** p<.01

Table 2.10: Leverage on Bargaining Power

This table contains regressions with hospital leverage as the dependent variable. All regressions include year fixed effects and standard errors clustered at the hospital level. The first column contains the five variables of interest *NegMktShare*, *NumHosp*, *HHI_Insurer*, *NoSystem*, and *Laws*. The second column contain other MSA level controls and hospital controls, and the final column contains hospital fixed effects. Variable definitions can be found in Table 2.1.

	(1) Leverage	(2) Leverage	(3) Leverage
NoSystem	0.0731***	0.0603***	-0.0326
	(4.61)	(3.82)	(-0.28)
Laws	0.0939***	0.0628***	
	(5.14)	(3.28)	
NegMktShare	0.00469	0.0497	0.160*
	(0.13)	(1.38)	(1.75)
NumHosp	0.00145***	0.00108**	-0.000249
	(3.38)	(2.46)	(-0.28)
HHI_Insurer	0.0223	0.0730	-0.0174
	(0.38)	(1.20)	(-0.40)
AvCost		0.000103***	0.0000660**
		(3.25)	(2.53)
CapEx		-0.000415***	-0.0000455
		(-2.79)	(-0.53)
NonProfit		0.0561***	-0.0446
		(3.04)	(-1.23)
NetIncomeAssets		-0.00248*	-0.00213***
		(-1.81)	(-5.13)
NumBeds		-0.0000461	0.00000159
		(-1.22)	(0.09)
Profit		-0.103***	0.0542
		(-2.92)	(1.16)
NumProcedures		-0.0000854	-0.0000332
		(-1.43)	(-0.73)
Teaching		-0.00288	
		(-0.17)	
NetIncomeVol		0.000784	
		(1.52)	
Year FE	Yes	Yes	Yes
Firm FE	No	No	Yes
N	6685	6685	6685
adj. R^2	0.039	0.071	0.013

t statistics in parentheses
* p<.10, ** p<.05, *** p<.01

Figure 1.1: Healthcare as Percent of GDP for OECD Countries

Spending on healthcare as percent of GDP for OECD countries 1980-2012. Produced by Veronique de Rugy. http://mercatus.org/publication/us-health-care-spending-more-twice-average-developed-countries

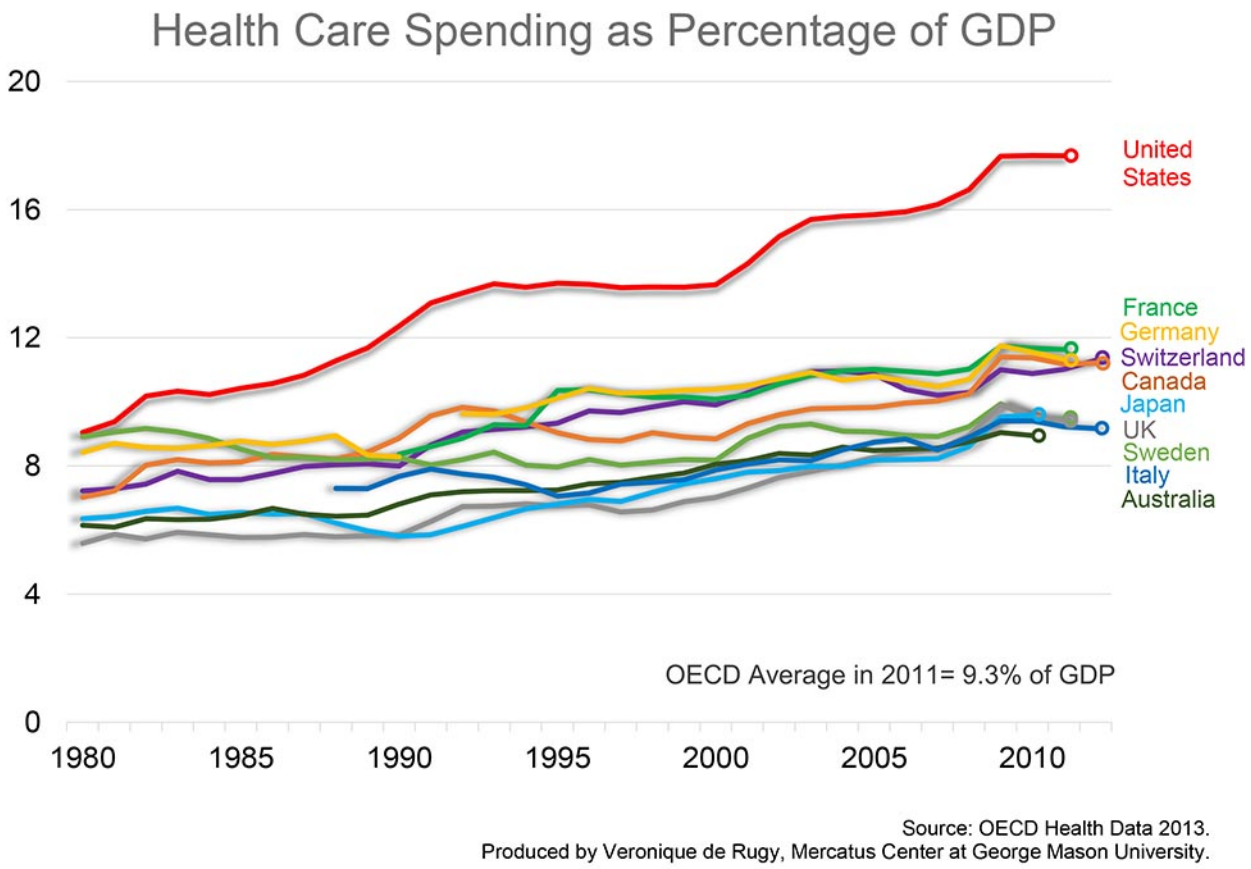
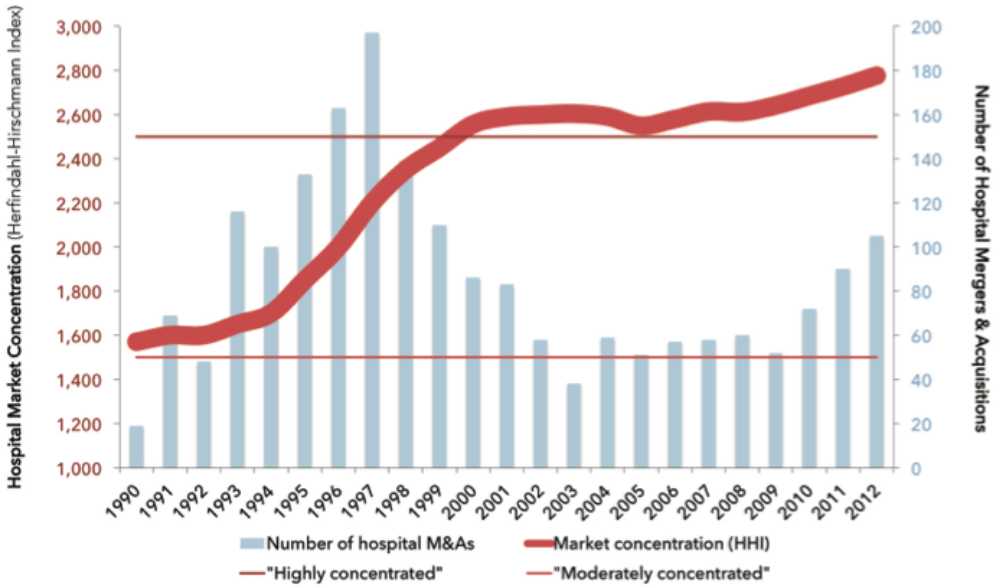


Figure 1.2: M&A Activity in U.S. Hospitals

M&A activity at hospitals since 1990 from Forbes by Avik Roy. http://www.forbes.com/sites/theapothecary/2015/01/12/what-60-minutes-didnt-tell-you-obamacare-will-drive-up-the-cost-of-hospital-care

Figure 18. Impact of Mergers and Acquisitions on Hospital Market Concentration, 1990–2012



A new wave of hospital mergers is driving market concentration higher. The blue bars denote the number of hospital merger and acquisition transactions in a given year; in the 1990s, penetration of managed-care insurers, with a mandate for more aggressive cost control, led hospitals to merge in response, strengthening their market power over the insurers. The Federal Trade Commission and the U.S. Department of Justice normally consider markets with HHI above 1,500 as "moderately concentrated" and markets with HHI above 2,500 as "highly concentrated," triggering antitrust litigation. However, consolidated hospital markets have largely avoided antitrust litigation. Today, more than half of the hospital markets in the United States have an HHI above 2,500, meaning that the DOJ and FTC would consider them to be "highly concentrated." *(Source: A. Roy analysis, Robert Wood Johnson Foundation, Martin Gaynor, Irving Levin Associates, HHS ASPE)*

Figure 2.1: Metropolitan Areas

This table contains a map of the metropolitan and micropolitan statistical areas in the US. The darker green shades are the metropolitan statistical areas and the markets in which I run all the tests.

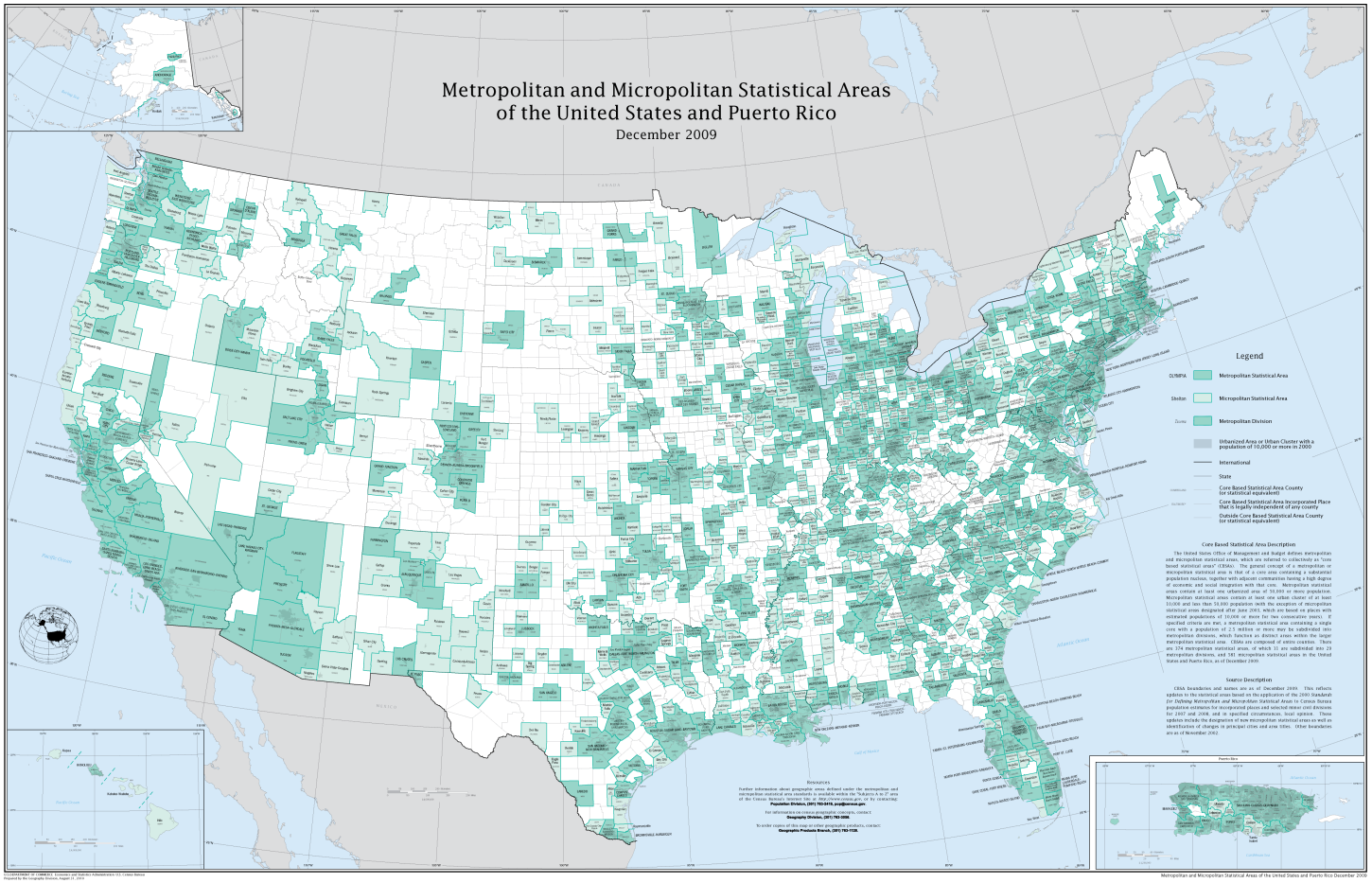


Figure 2.2: Laws on Medigap Policies

This table contains a map of the states and whether they have restrictions on the prices for Medigap policies. Orange states are the states that restrict insurance companies to price policies identically for older and younger disabled patients

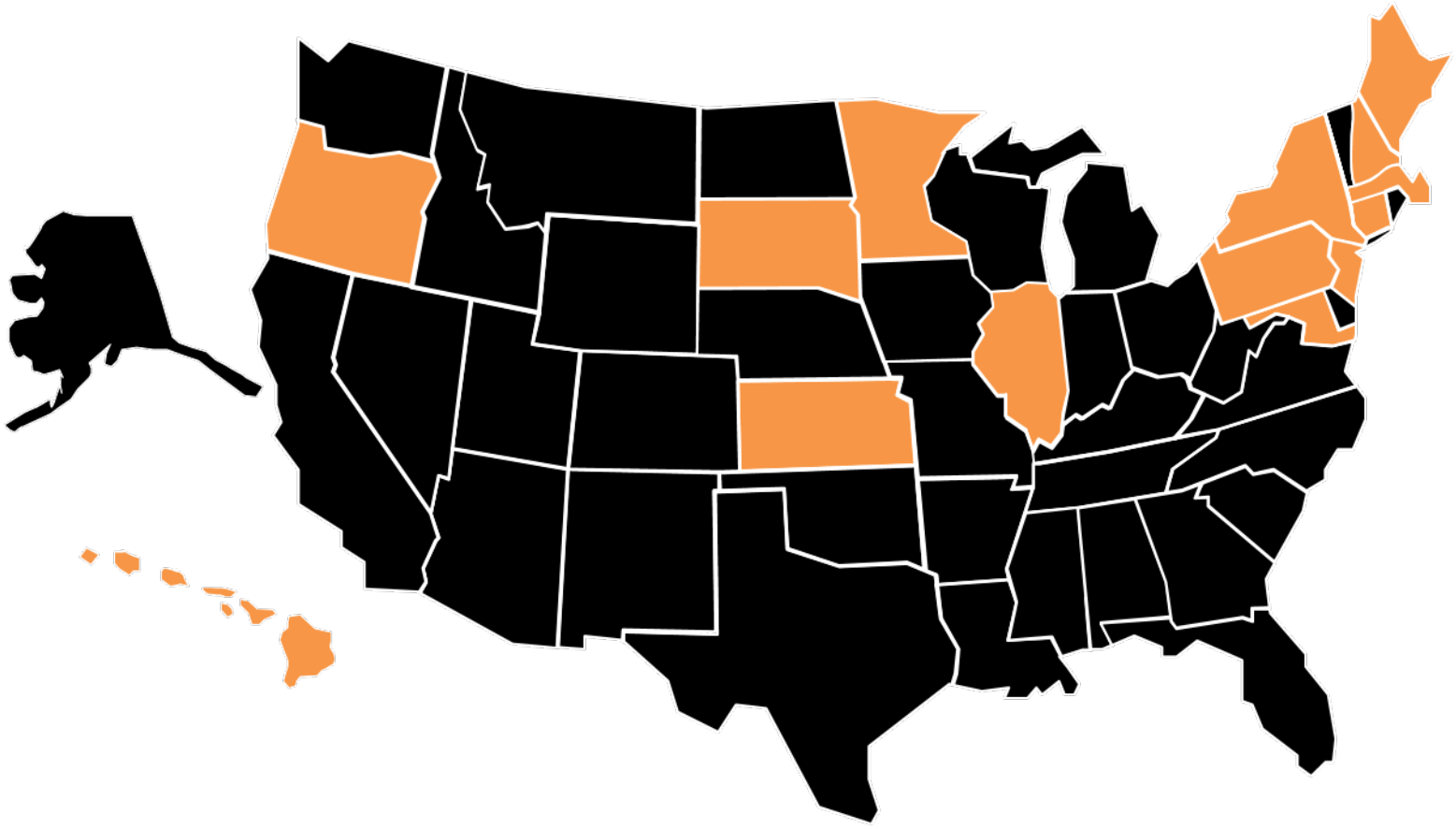
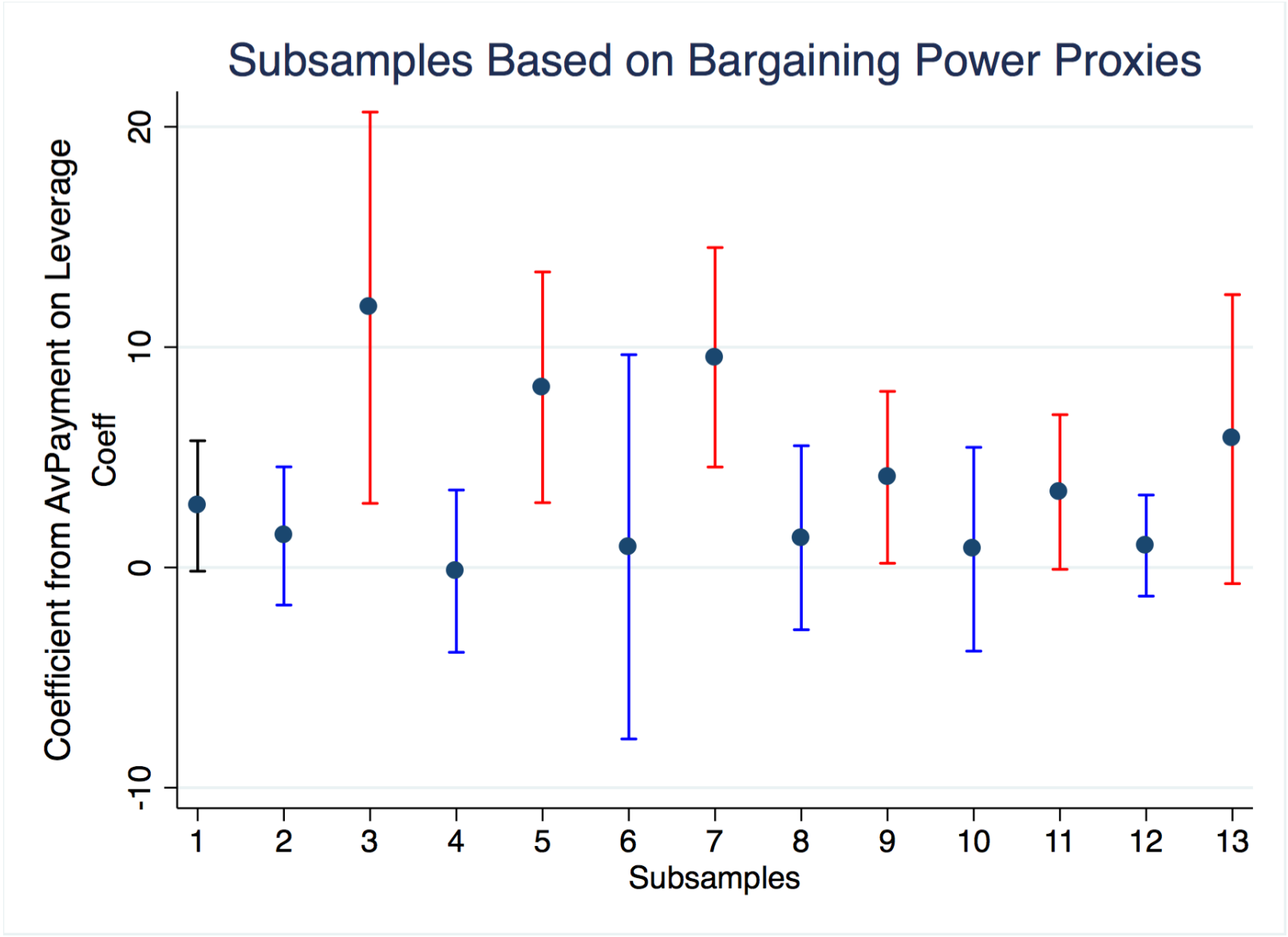


Figure 2.3: Subsample Regression Plots

This is a plot of the cross sectional coefficients of *Leverage* from equation 2.1 in regressions on *AvPayment*. The first plot is the coefficient for the entire sample. The red plots are subsample regressions for the hospitals with lower ex ante bargaining power as proxied by the six measures: *NoSystem*, below-median *MktShare*, *Urban*, above-median *NumHosp*, *HHI_Insurer* less than 0.25, and no state pooling Medigap laws. The blue plots are the corresponding regressions for hospitals with higher ex ante bargaining power.



Appendix

Appendix A

A.1 Payment on Net Leverage

A.2 Alternate GeoAdjFactor Scaling

A.3 System Weighted Average Payment

A.4 Cross-sectional Tests of NetLeverage on Bargaining Power Proxies

A.5 Fixed Effects Tests of Leverage Split on Bargaining Power Proxies

A.6 Subsample Based on Increase in Assets/Liabilities NetLeverage

A.7 Subsample Based on Increase in Assets/Liabilities Fixed Effects

A.8 Payment on Net Leverage by Corporate Type

A.9 Payment on Leverage by Corporate Type with Fixed Effects

A.10 Net Leverage on Bargaining Power

Table A.1: Payment on Net Leverage

This table contains regressions with *AvPayment* as the dependent variable with *NetLeverage* as the independent variables of interest. All columns contain year fixed effects and *GeoAdjFactor* with standard errors clustered at the hospital level. Column two contains additional hospital controls, while column three contains MSA controls. Column four includes hospital fixed effects. All variable definitions are in Table 2.1.

	(1) AvPayment	(2) AvPayment	(3) AvPayment	(4) AvPayment
NetLeverage	3.477**	2.414*	2.191	4.022**
	(2.47)	(1.70)	(1.53)	(2.23)
GeoAdjFactor	375.2***	367.5***	368.5***	
	(70.75)	(66.15)	(65.35)	
NoSystem		1.905	1.754	-9.036
		(1.27)	(1.17)	(-1.13)
AvCost		0.0121***	0.0114***	0.0200***
		(4.82)	(4.49)	(5.71)
CapEx		0.0115	0.0122	0.00734
		(0.86)	(0.92)	(0.74)
NonProfit		2.403	2.252	-3.179
		(1.30)	(1.20)	(-0.69)
NetIncomeAssets		0.00809	0.0116	0.0271
		(0.22)	(0.32)	(1.54)
NumBeds		0.00317	0.00305	0.00452**
		(1.29)	(1.24)	(2.47)
Profit		-0.467	-0.552	0.471
		(-0.20)	(-0.24)	(0.09)
MktShare		2.448	1.692	-24.28***
		(0.87)	(0.60)	(-3.02)
NumProcedures		0.0125**	0.0120**	-0.00330
		(2.56)	(2.47)	(-0.48)
Teaching		2.228	2.175	
		(1.64)	(1.60)	
NetIncomeVol		-0.0902**	-0.0853**	
		(-2.20)	(-2.08)	
PctOver45			0.180	
			(1.57)	
HHI_Insurer			5.780	-6.204*
			(1.46)	(-1.69)
Year FE	Yes	Yes	Yes	Yes
Hospital FE	No	No	No	Yes
N	6685	6685	6685	6685
adj. R^2	0.742	0.746	0.746	0.653

Table A.2: Alternate GeoAdjFactor Scaling

This table contains additional cross sectional regressions with various alternative measures of *AvPayment* on the LHS and alternative specifications for the *GeoAdjFactor*. *Geo2* is *GeoAdjFactor* squared. *DiffPay* is the difference between observed payments and a predicted payment if all patients were FFS Medicare patients using the base rate times two thirds times plus one third the unscaled base rate. *ScaledPay* is *AvPayment* divided by *GeoAdjFactor*.

	(1) DiffPay	(2) ScaledPay	(3) AvPayment
Leverage	3.045**	2.633*	2.834*
	(2.04)	(1.69)	(1.88)
NoSystem	1.618	2.085	1.922
	(1.08)	(1.40)	(1.28)
AvCost	0.0140***	0.0114***	0.0118***
	(5.74)	(4.69)	(4.73)
CapEx	0.0145	0.00729	0.0113
	(1.08)	(0.56)	(0.85)
NonProfit	2.919	2.322	2.213
	(1.56)	(1.22)	(1.19)
NetIncomeAssets	-0.00463	0.00215	-0.000246
	(-0.13)	(0.06)	(-0.01)
NumBeds	0.00320	0.00280	0.00333
	(1.28)	(1.14)	(1.35)
Profit	-0.447	-0.605	-0.424
	(-0.19)	(-0.26)	(-0.18)
HHI_Insurer	2.676	8.820**	7.571*
	(0.70)	(2.10)	(1.89)
MktShare	0.172	4.149	3.249
	(0.06)	(1.42)	(1.13)
NumProcedures	0.0124**	0.0114**	0.0110**
	(2.55)	(2.36)	(2.29)
Teaching	2.159	1.720	1.865
	(1.59)	(1.29)	(1.36)
NetIncomeVol	-0.0809**	-0.0861**	-0.0849**
	(-1.98)	(-2.11)	(-2.09)
GeoAdjFactor		-129.4***	571.5***
		(-26.44)	(8.72)
Geo2			-94.15***
			(-3.11)
N	6685	6685	6685
adj. R^2	0.122	0.486	0.749

t statistics in parentheses
* p<.10, ** p<.05, *** p<.01

Table A.3: System Weighted Average Payment

This table contains regressions with equal and value weighted payments by system are used as the dependent variable with independent variables either measured at the market level or by corresponding equal and value weighted measures. *EWLev* and *VWLev* are leverage equal weighted and value weighted, respectively. *EWCost* and *VWCost* are cost equal weighted and value weighted, respectively. Finally, *SystemMktShare* is the total market share the system has within the MSA.

	(1) EWAvPay	(2) VWAvPay
EWLev	9.528***	
	(3.27)	
VWLev		9.455***
		(3.30)
EWCost	0.00637*	
	(1.71)	
VWCost		0.00625*
		(1.69)
GeoAdjFactor	358.4***	359.0***
	(48.01)	(47.69)
systemweight	0.774	0.319
	(0.28)	(0.12)
PctOver45	0.228	0.272*
	(1.49)	(1.72)
HHI_Insurer	1.468	2.039
	(0.26)	(0.36)
Profit	-0.261	-0.241
	(-0.10)	(-0.09)
NonProfit	1.039	1.004
	(0.55)	(0.53)
N	3348	3348
adj. R^2	0.767	0.768

t statistics in parentheses

* p<.10, ** p<.05, *** p<.01

Table A.4
Cross-sectional Tests of NetLeverage Split on Bargaining Power Proxies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Leverage2	1.202	9.385**	-0.227	7.003***	1.549	9.329***	0.742	3.757**	0.268	3.099*	0.472	6.119*
	(0.78)	(2.23)	(-0.13)	(2.79)	(0.37)	(3.88)	(0.37)	(1.98)	(0.12)	(1.81)	(0.29)	(1.90)
AvCost	0.0137***	0.00487	0.0185***	0.00116	0.0329***	0.0588***	0.00959***	0.0111***	0.0148***	0.00993***	0.00569*	0.0173***
	(5.00)	(0.86)	(6.03)	(0.28)	(5.13)	(12.58)	(2.92)	(3.01)	(3.23)	(3.68)	(1.82)	(3.99)
CapEx	0.0168	-0.0248	0.0185	-0.0119	0.209***	0.122***	0.0133	0.0108	0.0156	0.00700	0.00143	0.0217
	(1.13)	(-0.85)	(1.20)	(-0.47)	(3.20)	(4.92)	(0.68)	(0.61)	(0.67)	(0.47)	(0.09)	(0.91)
NonProfit	3.446	0.382	1.787	1.532	12.55***	12.61***	0.851	4.587	2.326	2.124	1.472	4.516
	(1.31)	(0.14)	(0.69)	(0.59)	(3.16)	(3.63)	(0.40)	(1.43)	(0.67)	(1.07)	(0.72)	(0.75)
NetIncomeAssets	0.00521	3.595	0.213***	0.00536	0.00000963***	-0.0414	0.0191	-0.143	-0.192	0.0349	0.0194	-0.508***
	(0.14)	(1.07)	(2.82)	(0.16)	(2.89)	(-0.60)	(0.45)	(-0.62)	(-0.69)	(0.94)	(0.44)	(-7.41)
NumBeds	0.00255	0.00809	0.00278	0.00787	0.0238	0.000547	-0.00849**	0.00868***	0.00610	0.00000530	-0.00101	0.00907*
	(0.99)	(1.07)	(1.09)	(1.09)	(1.23)	(0.11)	(-2.00)	(2.84)	(1.46)	(0.00)	(-0.36)	(1.94)
Profit	0.125	-0.308	0.597	-4.367	1.468	-2.227	-0.340	-1.179	0.395	-0.872	-2.338	8.894
	(0.04)	(-0.07)	(0.19)	(-1.37)	(0.28)	(-0.55)	(-0.13)	(-0.30)	(0.10)	(-0.36)	(-0.93)	(1.32)
GeoAdjFactor	370.4***	362.7***	376.8***	354.7***			358.3***	380.5***	379.4***	355.0***	368.2***	355.8***
	(55.18)	(34.51)	(54.88)	(40.69)			(48.27)	(44.67)	(45.10)	(49.50)	(57.44)	(31.32)
HHI_Insurer	8.386*	-1.204	7.837	1.886			0.833	10.15			12.32***	-14.88
	(1.83)	(-0.14)	(1.62)	(0.28)			(0.18)	(1.37)			(2.67)	(-1.58)
MktShare	1.361	1.766			8.382**	-43.40***	4.457	-6.756	1.292	1.852	-0.869	8.894*
	(0.41)	(0.34)			(2.46)	(-9.47)	(1.34)	(-0.82)	(0.22)	(0.62)	(-0.26)	(1.68)
NumProcedures	0.0119**	0.0133	0.0134**	0.00826	0.0654**	0.0163*	0.0154**	0.0102	0.0172*	0.0108**	0.0216***	0.000290
	(2.36)	(0.89)	(2.35)	(0.96)	(2.40)	(1.71)	(2.17)	(1.52)	(1.89)	(2.11)	(2.97)	(0.05)
Teaching	1.414	4.515	1.799	3.234	12.03**	3.023	1.404	3.459*	0.747	2.856*	3.185**	-0.299
	(0.95)	(1.43)	(1.16)	(1.30)	(2.31)	(1.20)	(0.76)	(1.79)	(0.32)	(1.92)	(2.03)	(-0.12)
NoSystem			0.513	1.821	2.869	-2.323	2.827	-0.790	2.409	1.279	1.848	1.102
			(0.22)	(0.93)	(0.85)	(-0.88)	(1.57)	(-0.30)	(0.92)	(0.78)	(1.04)	(0.41)
N	5026	1659	4126	2559	2943	6884	3472	3235	2519	4341	4651	2034
adj. R^2	0.747	0.753	0.747	0.753	0.293	0.304	0.748	0.732	0.747	0.717	0.719	0.738

In this table consists of subsample regressions split on six bargaining power proxies. All low bargaining power groups are in the even columns, while high bargaining power groups are in the odd columns. Column 1 consists of hospitals in a hospital system, 2 is stand-alone hospitals, 3 is above-median *MktShare* in the MSA-year, 4 is below-median, 5 is rural hospitals, 6 is hospitals in MSAs, 7 is hospitals that have below-median hospitals in their MSA for that year, 8 is above-median, 9 is hospitals that bargain with insurance companies with an HHI less than 0.25, 10 bargain with those above 0.25, 11 operate in states without Medigap pooling laws, and 12 operate in states with these laws.
This table includes year fixed effects and standard errors are clustered at the hospital level. t-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table A.5
Fixed Effects Regressions of Leverage Split on Bargaining Power Proxies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Leverage	5.478**	1.779	3.097	8.956**	2.925	5.040**	6.049**	4.621	3.538	4.557*	3.640*	9.016
	(2.56)	(0.28)	(1.34)	(2.56)	(0.93)	(2.53)	(2.17)	(1.49)	(1.29)	(1.74)	(1.80)	(1.42)
AvCost	0.0234***	0.0125**	0.0230***	0.0152***	0.0352***	0.0202***	0.0161***	0.0241***	0.0270***	0.0155***	0.0196***	0.0212***
	(5.58)	(2.07)	(4.85)	(2.79)	(6.40)	(5.91)	(3.60)	(4.32)	(3.88)	(4.17)	(5.11)	(3.31)
CapEx	0.00483	0.0216	0.00592	0.0160	0.0357	0.00620	0.00137	0.0140	-0.000152	0.00419	0.00111	0.0125
	(0.44)	(0.89)	(0.53)	(0.72)	(1.23)	(0.64)	(0.10)	(0.93)	(-0.01)	(0.37)	(0.09)	(0.75)
NonProfit	-6.346	8.434	-7.994	7.840	4.724	-3.262	-2.828	-3.904	-21.30**	-0.505	-1.036	-9.215
	(-1.16)	(1.34)	(-1.51)	(1.05)	(0.60)	(-0.71)	(-0.56)	(-0.44)	(-2.39)	(-0.11)	(-0.21)	(-0.72)
NetIncomeAssets	0.0134	3.276	0.0866	0.0217**	0.0000498***	0.0152	0.00700	0.123**	0.108*	0.0120	0.00210	2.746
	(0.96)	(1.16)	(1.17)	(2.21)	(9.56)	(1.00)	(0.66)	(2.05)	(1.95)	(0.91)	(0.16)	(0.69)
NumBeds	0.00571***	-0.0474*	0.00247	-0.0432	-0.0155	0.00426**	0.0331**	0.00320	-0.0608**	0.00644***	0.00495***	-0.0116
	(3.35)	(-1.84)	(1.54)	(-1.16)	(-0.35)	(2.30)	(2.03)	(1.08)	(-2.15)	(3.46)	(3.12)	(-0.36)
Profit	-1.392	6.765	-0.576	4.110	4.839	0.610	-1.232	1.074	-12.24	3.608	0.814	-4.124
	(-0.24)	(1.01)	(-0.09)	(0.51)	(0.52)	(0.12)	(-0.22)	(0.11)	(-1.31)	(0.70)	(0.15)	(-0.31)
HHI_Insurer	-5.146	-9.902	-9.425**	15.22			-3.549	-15.65*			-1.651	-19.72*
	(-1.35)	(-0.94)	(-2.11)	(1.54)			(-0.92)	(-1.69)			(-0.43)	(-1.73)
MktShare	-27.87***	18.61			9.642	-23.22***	-25.66***	-19.27	-13.65	-29.76***	-18.41**	-79.15***
	(-3.42)	(0.75)			(0.63)	(-2.91)	(-2.78)	(-1.01)	(-0.93)	(-3.17)	(-2.31)	(-3.90)
NumProcedures	-0.00103	-0.0100	0.00517	-0.0151	-0.0282	-0.00105	-0.00105	-0.00642	0.0143	0.000680	-0.00752	0.00802
	(-0.15)	(-0.56)	(0.60)	(-1.31)	(-1.50)	(-0.16)	(-0.11)	(-0.67)	(0.88)	(0.09)	(-1.00)	(0.58)
NoSystem			13.36***	-18.33*	9.124***	-8.678	6.914*	-18.47**	-29.03***	-2.101	-6.327	-7.885
			(11.23)	(-1.79)	(8.02)	(-1.04)	(1.76)	(-2.37)	(-19.45)	(-0.30)	(-0.59)	(-1.38)
N	5026	1659	4126	2559	2943	6884	3472	3235	2519	4341	4651	2034
adj. R^2	0.647	0.676	0.654	0.652	0.629	0.659	0.661	0.639	0.560	0.693	0.640	0.694

In this table consists of subsample regressions split on six bargaining power proxies. All low bargaining power groups are in the even columns, while high bargaining power groups are in the odd columns. Column 1 consists of hospitals in a hospital system, 2 is stand-alone hospitals, 3 is above-median *MktShare* in the MSA-year, 4 is below-median, 5 is rural hospitals, 6 is hospitals in MSAs, 7 is hospitals that have below-median hospitals in their MSA for that year, 8 is above-median, 9 is hospitals that bargain with insurance companies with an HHI less than 0.25, 10 bargain with those above 0.25, 11 operate in states without Medigap pooling laws, and 12 operate in states with these laws.
This table includes year fixed effects and standard errors are clustered at the hospital level. t-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table A.6: Subsample Based on Increase in Assets/Liabilities NetLeverage

This table contains regressions with average payment as the dependent variable. All regressions include year fixed effects, controls and standard errors clustered at the state level. Column 1 contains hospitals that did not increase assets or long-term liabilities from the previous year. Column 2 contains hospitals that had an increase in assets with no increase in liabilities. Column 3 contains hospitals that increase liabilities with no increase in assets and Column 4 contains an increase in both assets and liabilities.

	(1) NoIncrease	(2) AssetIncrease	(3) LiabIncrease	(4) BothIncrease
NetLeverage	-0.302	2.398	5.296	4.647*
	(-0.16)	(0.98)	(1.64)	(1.74)
NoSystem	-1.129	1.691	6.154**	2.237
	(-0.50)	(0.87)	(2.13)	(1.07)
AvCost	0.0130***	0.00734**	0.00553	0.0168***
	(2.98)	(2.07)	(1.05)	(4.84)
CapEx	0.0274	-0.00206	-0.0658	0.00904
	(0.34)	(-0.07)	(-0.51)	(0.42)
NonProfit	4.517*	2.075	0.939	-0.556
	(1.65)	(0.87)	(0.27)	(-0.19)
NetIncomeAssets	-0.0164	-0.00776	2.437	0.833
	(-0.07)	(-0.50)	(0.50)	(0.39)
PctOver45	0.00116	0.177	-0.0403	0.358**
	(0.01)	(1.21)	(-0.16)	(2.01)
NumBeds	0.00209	0.00303	0.00461	0.00330
	(0.75)	(0.86)	(0.80)	(0.79)
Profit	-1.652	2.031	-6.548	-1.448
	(-0.50)	(0.66)	(-1.46)	(-0.39)
GeoAdjFactor	358.9***	370.8***	337.6***	381.0***
	(41.02)	(46.20)	(27.48)	(49.88)
HHI_Insurer	8.837	5.334	-6.957	6.990
	(1.58)	(1.01)	(-0.73)	(1.05)
MktShare	0.620	-2.496	-4.722	8.876**
	(0.14)	(-0.68)	(-0.75)	(2.34)
NumProcedures	0.00847	0.0173**	0.00756	0.00992*
	(0.91)	(2.29)	(0.89)	(1.66)
Teaching	3.677*	0.237	3.276	2.674
	(1.84)	(0.13)	(1.24)	(1.40)
NetIncomeVol	-0.148**	-0.0426	-0.113	-0.0856
	(-2.14)	(-0.76)	(-1.56)	(-1.53)
N	1564	2170	797	2154
adj. R^2	0.725	0.745	0.710	0.766

t statistics in parentheses
* p<.10, ** p<.05, *** p<.01

Table A.7: Subsample Based on Increase in Assets/Liabilities Fixed Effects

This table contains regressions with average payment as the dependent variable. All regressions include year fixed effects, controls and standard errors clustered at the state level. Column 1 contains hospitals that did not increase assets or long-term liabilities from the previous year. Column 2 contains hospitals that had an increase in assets with no increase in liabilities. Column 3 contains hospitals that increase liabilities with no increase in assets and Column 4 contains an increase in both assets and liabilities.

	(1) NoIncrease	(2) AssetIncrease	(3) LiabIncrease	(4) BothIncrease
Leverage	2.535	10.33*	10.60	3.758
	(0.66)	(1.75)	(1.15)	(0.56)
NoSystem	0.281	-0.0103	-10.14**	
	(0.08)	(-0.00)	(-2.00)	
AvCost	0.0329***	0.0211***	0.0349**	0.0165***
	(3.37)	(3.06)	(2.08)	(2.88)
CapEx	-0.0873	0.0460	0.310	-0.00277
	(-0.89)	(1.50)	(1.58)	(-0.13)
NonProfit	3.686	-20.01	-1.784	-9.170*
	(0.51)	(-1.18)	(-0.40)	(-1.88)
NetIncomeAssets	-0.317*	-0.0387**	1.104	1.678
	(-1.94)	(-2.20)	(0.14)	(0.27)
NumBeds	0.00575***	0.0494	0.0758	-0.00637
	(2.62)	(1.56)	(1.32)	(-0.22)
Profit	-0.352	-16.52	0	-2.802
	(-0.04)	(-0.84)	(.)	(-0.36)
HHI_Insurer	-5.098	-13.09***	-35.15	-14.23
	(-0.30)	(-2.80)	(-1.14)	(-0.99)
MktShare	-39.08*	-21.96	-46.51	-10.55
	(-1.68)	(-1.23)	(-1.13)	(-0.51)
NumProcedures	-0.0291	-0.0107	-0.0293	-0.00861
	(-1.17)	(-0.69)	(-0.79)	(-0.64)
N	1564	2170	797	2154
adj. R^2	0.627	0.671	0.656	0.669

t statistics in parentheses
* p<.10, ** p<.05, *** p<.01

Table A.8: Payment on Net Leverage by Corporate Type

This table contains cross sectional regressions with *AvPayment* as the dependent variable for subsets of hospitals based on their corporate status. Column 1 contains the subset of for-profit hospitals, Column 2 contains nonprofit hospitals and Column 3 contains the hospitals that switched from nonprofit to for-profit during my sample.

	(1)	(2)	(3)
	Profit	NonProfit	Switchers
NetLeverage	-0.174	3.888*	1.236
	(-0.08)	(1.87)	(0.20)
AvCost	0.0170**	0.0104***	0.00155
	(2.58)	(3.47)	(0.16)
CapEx	0.00942	0.0102	0.0793
	(0.21)	(0.66)	(1.09)
NoSystem	5.783	0.282	3.431
	(1.52)	(0.15)	(0.30)
NetIncomeAssets	1.333	0.0129	0.0494
	(0.58)	(0.36)	(0.08)
PctOver45	-0.0832	0.358**	1.943**
	(-0.33)	(2.56)	(2.50)
NumBeds	-0.000475	0.00282	-0.00880
	(-0.05)	(1.01)	(-0.34)
GeoAdjFactor	391.7***	362.9***	389.3***
	(26.90)	(54.80)	(16.47)
HHI_Insurer	6.696	7.340	27.89
	(0.97)	(1.29)	(0.89)
MktShare	8.920	-1.155	-29.35**
	(1.03)	(-0.35)	(-2.03)
NumProcedures	0.0145	0.0112**	-0.0112
	(1.16)	(2.09)	(-0.39)
Teaching	5.699*	1.361	3.332
	(1.75)	(0.87)	(0.56)
NetIncomeVol	-0.195	-0.0718	-0.0244
	(-0.97)	(-1.55)	(-0.06)
N	1160	4709	161
adj. R^2	0.675	0.754	0.878

t statistics in parentheses
* p<.10, ** p<.05, *** p<.01

Table A.9: Payment on Leverage by Corporate Type with Hospital FE

This table contains hospital fixed effects regressions with *AvPayment* as the dependent variable for subsets of hospitals based on their corporate status. Column 1 contains the subset of for-profit hospitals, Column 2 contains nonprofit hospitals and Column 3 contains the hospitals that switched from nonprofit to for-profit during my sample.

	(1)	(2)	(3)
	Profit	NonProfit	Switchers
Leverage	5.490**	2.599	6.578
	(2.16)	(0.77)	(0.78)
AvCost	0.0249**	0.0201***	0.00281
	(2.42)	(4.73)	(0.24)
CapEx	-0.0498	0.00127	0.0403
	(-1.14)	(0.11)	(0.77)
NoSystem		-8.976	
		(-1.11)	
NetIncomeAssets	8.264*	0.00349	0.588
	(1.81)	(0.26)	(0.88)
NumBeds	-0.0423	0.00438***	-0.262**
	(-0.71)	(3.06)	(-2.25)
HHI_Insurer	-3.001	-9.613	-89.81***
	(-0.80)	(-1.32)	(-3.00)
MktShare	-17.90	-21.61*	-75.71**
	(-1.06)	(-1.92)	(-2.67)
NumProcedures	-0.0663**	0.00319	0.0596
	(-2.26)	(0.42)	(1.50)
N	1160	4709	161
adj. R^2	0.533	0.674	0.733

t statistics in parentheses

* p<.10, ** p<.05, *** p<.01

Table A.10: Net Leverage on Bargaining Power

This table contains regressions with net hospital leverage as the dependent variable. All regressions include year fixed effects and standard errors clustered at the hospital level. The first column contains the four variables of interest *NegMktShare*, *HHI_Insurer*, *System*, and *NoLaws*. The second column contain other MSA level controls and hospital controls, and the final column contains hospital fixed effects. Variable definitions can be found in Table 2.1.

	(1) NetLeverage	(2) NetLeverage	(3) NetLeverage
NoSystem	0.0557***	0.0467***	0.00495
	(3.40)	(2.88)	(0.06)
SamePremium	0.0935***	0.0658***	
	(5.06)	(3.38)	
NegMktShare	-0.00565	0.0386	0.150
	(-0.15)	(1.04)	(1.51)
NumHosp	0.00159***	0.00118***	-0.00107
	(3.59)	(2.61)	(-1.14)
HHI_Insurer	0.0127	0.0609	-0.0192
	(0.21)	(0.98)	(-0.43)
AvCost		0.000105***	0.0000795***
		(3.22)	(2.82)
CapEx		-0.000430***	-0.0000829
		(-2.83)	(-0.89)
NonProfit		0.0512***	-0.0199
		(2.73)	(-0.53)
NetIncomeAssets		-0.00605***	-0.00590***
		(-4.17)	(-7.34)
NumBeds		-0.0000264	-0.000000654
		(-0.68)	(-0.03)
Profit		-0.0789**	0.0998**
		(-2.18)	(2.16)
NumProcedures		-0.0000672	-0.0000294
		(-1.12)	(-0.57)
Teaching		-0.00337	
		(-0.19)	
NetIncomeVol		0.00107**	
		(2.04)	
Year FE	Yes	Yes	Yes
Firm FE	No	No	Yes
N	6685	6685	6685
adj. R^2	0.034	0.060	0.031

t statistics in parentheses
* p<.10, ** p<.05, *** p<.01

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